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April 29, 2013

U.S. House Committee on Energy and Commerce
Chairman Fred Upton
Ranking Member Henry Waxman
2125 Rayburn House Office Building
Washington, DC 20515

Submitted via Email: RFS@mail.house.gov
RE: Committee White Paper on Renewable Fuel Standard and Agricultural Sector Impacts

Dear Chairman Upton and Ranking Member Waxman:

Once again we appreciate the opportunity to weigh in on this series of white papers issued by the Committee on Energy and Commerce as you review the Renewable Fuel Standard (RFS). We appreciate your efforts to better understand the issues related to the RFS, which we believe is already one of the most effective U.S. energy policies in recent history. We look forward to working with both Congress and the Administration as we continue to shift toward a true "all of the above" energy policy that will strengthen our economic and energy security.

The National Biodiesel Board (NBB) is the national trade association representing the biodiesel industry and the coordinating body for research and development in the United States. Since 1992 when it was founded, NBB has developed into a comprehensive industry association that works closely with a broad range of stakeholders including industry, government and academia.

Before we discuss the relevant questions highlighted by the Committee, it is important to note that the Biomass-based Diesel section of the RFS is working as intended. Biodiesel is the first EPA-designated Advanced Biofuel to be produced on a commercial scale across the country, and it has exceeded its RFS targets over the past two years. It is made from a diverse mix of feedstocks – including recycled cooking oil, agricultural oils such as soybean and canola oil, and animal fats – with new feedstocks added annually. Most biodiesel producers can jump from one feedstock to another if prices rise or supplies are short. Because of that, and because of flexibility built into the RFS, the impact of biodiesel production on commodities markets is negligible.

For this inquiry, it is also important to understand the scale and perspective of the biodiesel marketplace. In 2011 and 2012, the U.S. biodiesel industry produced about 1 billion gallons each year. In 2013 the RFS requires 1.28 billion gallons. By comparison, the diesel pool is nearly 60 billion gallons, the gasoline pool is nearly 133 billion gallons, and the ethanol pool is approximately 13.5 billion gallons.

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Since the Biomass-based Diesel (BBD) program began in 2010 under the RFS, our industry has produced more biodiesel than is required by the program, has lowered the price of diesel to consumers, and in a number of ways has directly decreased the cost of food and commodity production.

We believe biodiesel is the single best transportation fuel produced on a commercial scale in the U.S., gallon for gallon, BTU for BTU, energy balance for energy balance. With the added benefit of reducing greenhouse gas emissions by more than 50% when compared to the diesel fuel it replaces, biodiesel is simply a cleaner-burning, highly efficient, and economically competitive alternative for both consumers and as a component of the national energy policy.

The most recent E&C white paper on *Agricultural Sector Impacts* raised nine questions. We are responding to questions Nos. 1, 2, 3, 5 and 9 – all of which directly or indirectly involve the biodiesel industry. Before we do, please also consider the following brief overview and backgrounder on biodiesel as it relates to feedstocks and the RFS generally:

***RFS Flexibility:*** The RFS was designed with flexibility to handle occasional disruptions or other compliance issues unique to individual obligated parties. For example, refiners can defer up to 20 percent (200 million gallons) of their annual requirement to the following year. In addition, the biodiesel industry has exceeded the RFS requirement in every year of the RFS, which gives obligated parties choices on how to use that production in later years.

***Continued dependence on imported oil is the long-term culprit of rising food costs; commodities play a small role:*** In 2012, the drought may have caused an increase in food prices, but the real driver of rising food costs continues to be increased petroleum and fuel prices. Until we have diversity in our fuel supplies, we will always be vulnerable to inflated global oil prices and the endless cycle of price spikes that routinely disrupt our economy. In addition, commodities account for a small portion of consumer prices, which are largely driven by other factors such as energy, marketing, packaging, transportation, etc.

***Biodiesel Production Reduces Livestock Costs:*** A number of livestock groups are on record supporting biodiesel production. First, the protein meal from soy, a staple in animal diets, is less expensive today because of the demand for biodiesel. Increased demand for the oil leads to larger supplies of protein-rich meal, which suppresses prices. In addition, animal fats are used as a feedstock for biodiesel production, which increases the value of animal agriculture. The demand for animal fats as biodiesel feedstocks improves the value per head for livestock and reduces price pressures on consumer meat and dairy products. Specifically, the increased demand for animal fats created by the biodiesel industry directly adds $10 to $12 per head for cattle; $1 to $1.25 per head for hogs; and $0.11 to $0.12 per head for chickens; the combined total value added for these commodities in 2011 was $291.7 to $351.2 million.

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***Untapped Potential from Waste Resource:*** Recycled cooking oil, animal fats, other biogenic waste oils, camelina and algae qualify as feedstocks for the RFS. Most yellow grease is produced by restaurant and food operations as they recycle cooking oils. Consequently, yellow grease output is directly tied to the number and type of restaurants in a given location (the typical McDonald's changes their cooking oils about every two weeks). For example, New York State produces roughly 180 million pounds of yellow grease annually. If all of this were used for biodiesel production, this would provide 24 million gallons of biodiesel.

***Important Points Regarding Biodiesel Production From Soybean Oil:*** Soybean oil has accounted for about half of U.S. biodiesel production in recent years. Looking forward to 2013, economic analysis estimates soybean oil-based biodiesel will represent only 47% of the market in 2013.[1] In 2013, it is anticipated that the likely remaining 680 million gallons, or approximately 53% of biodiesel feedstocks, will come from other feedstock sources (recycled cooking oil, other agricultural oils such as canola oil, animal fats, inedible corn oil from ethanol production, other biogenic waste oils and algae).

***Question No. 1: What has been the impact of the RFS on corn prices in recent years? What has been the impact on soybean prices? Have other agricultural commodity prices also been affected?***

Biodiesel is not produced using corn, so we will limit our comments to impacts on the many feedstocks used to produce biodiesel: the oil from the crushing of soybeans; the leftover fats or the waste portion from chickens, hogs, turkeys and cattle; yellow and brown grease (restaurant grease); the oil from crushing canola seeds; the oil from crushing camelina seeds; nonedible corn oil derived from the production of distillers grains; and oil from the production of algae.

Generally, the impact of the biodiesel portion of the RFS on these markets has been significantly positive. First, biodiesel's use of waste cooking oil and animal fats adds value to restaurant and livestock operations. For example, if you're a farmer producing hogs, chickens, turkeys or cattle, your commodity is worth more because biodiesel production is increasing the demand for waste fats and creating greater value per animal. Specifically, biodiesel directly adds $10 to $12 per head for cattle; $1 to $1.25 per head for hogs; and $0.11 to $0.12 per head for chickens. The combined total value added for these commodities in 2011 was $291.7 to $351.2 million. U.S. biodiesel producers consumed 1.29 billion pounds of animal fats in 2011.

Additionally, the portion of biodiesel made from soybean oil is helping hold down livestock feed prices. In fact some of the biggest investors in biodiesel production are major cattle and chicken operations – for example, Tyson's, Cargill, Perdue and others have invested in the production of

[1] *Biodiesel Production Prospects for the Next Decade.* By: John R. Kruse, PhD; IHS Global Insight; March 11, 2011.

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Biodiesel or Renewable Diesel. Specifically, biodiesel uses only the oil from soybeans and none of the protein-rich meal. As a result, that meal – a staple in animal diets – is less expensive because of the increased demand for the oil. A recent study from Centrec Consulting Group found that without biodiesel production, the higher soybean meal prices could have cost the livestock industry an additional $1.4 billion in 2007 and a total of $4.8 billion from 2005 to 2009.[2] Due to increased supply, soybean meal prices were $16 to $48 per ton less than they would have otherwise been from 2005 to 2009.

A 2012 analysis by the Center for Agriculture and Rural Development at Iowa State University (CARD) found similar results. CARD analyzed the impacts of the elimination of biodiesel production, based on the most recent RFS waiver request. CARD estimated that, if there is a waiver of the RFS in its entirety, then "practically all biodiesel production from vegetable oil would be stopped," even though the price of soybean oil would be expected to decrease.[3] While there have been passing references to the increased price of soybean crops by some supporters of a waiver, if the RFS went away, then "the price of soybean meal would [actually] rise by $21 per ton because of decreased supplies of meal." [4].

As a result of these mutually beneficial economics, a number of livestock groups are on record supporting biodiesel production. For example, the National Pork Producers Council supports increased biodiesel production [5] along with the Western Organization of Resource Councils[6] and the Iowa Cattlemen's Association.[7]

***Question No. 2: How much has the RFS increased agricultural output? How many jobs has it created? Have any jobs been lost? What is the net impact on the agriculture sector?***

The biodiesel industry has production plants in nearly every state in the country, and the growth of the industry since the creation of the RFS has created thousands of new jobs and improved local economies across the country. Furthermore, biodiesel has had a positive impact on all biodiesel feedstock providers; including but not limited to producers of the following

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[2] Centrec Consulting Group, LLC, Economic Impacts of Biodiesel Production on the Soybean Sector, Revisited, at 4 (Dec. 2010), available at http://www.ilsoy.org/_data/mediaCenter/files/1185.pdf

[3] CARD Aug. 2012 Policy Brief at 8.

[4] Centrec Consulting Group, LLC, Soybean Oil and Meal Economics: How Livestock Producers Benefit from Biodiesel Production, at 4 (Feb. 2011), available at http://www.ilsoy.org/_data/mediaCenter/files/1282.pdf (finding, if there is reduced biodiesel production, "Soybean meal prices would increase; livestock producers could possibly pay anywhere from $34 to $50 per ton more for their soybean meal by MY15")

[5] National Pork Producers Council Policy Position: http://www.nppc.org/wp-content/uploads/2007PorkForum.pdf and Biofuels Development, http://www.nppc.org/issues/environment-energy/biofuels-development/ .

[6] See, Western Organization of Resource Councils, Biodiesel Benefits for Cattle Producers, http://www.worc.org/Biodiesel-Benefits/.

[7] ICA Policy, Business Issues Committee, available at http://iacattlemen.org/policy-making.aspx .

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feedstocks: chicken fat, turkey fat, hog fat, cattle fat, yellow grease, brown grease, trap grease, soybean oil, canola oil, camelina oil, non-edible corn oil from the production of distillers grains, and algal oil.

The industry is using an increasingly diverse mix of feedstocks, and the industry's growth has helped diversify our energy supply while creating jobs and economic activity. In 2011 and 2012, the U.S. biodiesel industry produced consistent record production of nearly 1.1 billion gallons in each year and in 2012 supported approximately 50,000 jobs across the economy, while also generating income of nearly $3.0 billion in household income to be circulated throughout the economy and supporting more than $5.0 billion in GDP.

The industry supports jobs in a variety of sectors, from manufacturing to transportation, agriculture and service. It is important to note that not all of these jobs are solely attributable to the RFS.

When looking at jobs withinan industry sector like biodiesel production it is necessary to understand the way in which different sectors or industries in the economy are linked to each other. For example, in the renewable fuels production sector, the biodiesel industry buys, among its varied feedstocks, soybean oil from the oilseed processing industry, which, in turn, then buys soybeans from the agriculture sector, which purchases crop production products and fertilizers from the agricultural chemicals industry, which in turn purchases from a range of other industries. Expenditures on other feedstocks such as other fats and oils including recycled oils and grease represent purchases of output from the waste management sector. These are referred to as backward linkages. There are also forward looking linkages. For example, the manufacturing operations would be considered a forward linkage. The household sector is linked to all sectors as it provides the labor and management needed by each. In turn, changes that affect the incomes of the household sector typically have more significant impacts compared to a change in the sales of other sectors.

A recent 2012 report by Informa Economics summarizes additional benefits that focus on risk mitigation for agricultural producers. Those benefits include linking vegetable oils and animal fats to their energy value, creating a floor for commodity values, and serving as a hedge against energy inflation for producers. A robust biodiesel industry will decrease the potential use of farm safety net programs included in the Farm Bill and decrease the chance that farm income will be squeezed due to energy price spikes. This is significant as most farm inputs are linked to petroleum energy values.

***Question No. 3: Was EPA correct to deny the 2012 waiver request? Are there any lessons that can be drawn from the waiver denial?***

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While the waiver requests submitted appeared to be aimed largely at the conventional biofuel portion of the RFS, NBB provided comment to the EPA calling for a rejection of a waiver. Critics of the RFS argued during the drought that maintaining biofuel requirements would dramatically drive up commodity prices. However, the facts surrounding the biodiesel portion of the RFS strongly suggest otherwise: The average price of soybean oil – the leading biodiesel feedstock, accounting for about half of U.S. production – stood at 54.1 cents per pound in 2011 and dropped to 51.7 cents per pound in 2012. As of April 26, 2013 the price stood at 49.6 cents per pound.

Previously, in 2008, the EPA properly denied a request by the State of Texas to waive a portion of the RFS program based on similar grounds. 73 Fed. Reg. 47,168 (Aug. 13, 2008). As with Texas' 2008 request, the letters submitted requesting the waiver in 2012 did do not present adequate (if any) support for a waiver. Indeed, NBB believed the requests should have been denied outright as there was a failure to provide any of the required analyses outlined in EPA's denial of Texas' 2008 request. In any event, there were significant reasons for EPA to deny the request.

As part of the rule, the EPA provided additional flexibility in its regulations to account for the possibility of short term feedstock disruptions, and a waiver would not have effectively addressed the harms alleged. The waiver would have significantly adversely affected, among others, farmers, the biofuels industry, and the general public. More importantly it would have undermined the clear policy choice by Congress to promote renewable fuel use and reduce this country's dependence on foreign oil.

Unfortunately, the parochial politics of petroleum, livestock, poultry and ethanol have likely forever clouded the true policy benefits of renewable fuels and domestic energy policy. Congress created the RFS with overwhelming bipartisan support for good reason -- to reduce U.S. reliance on fossil fuels and foreign oils thus improving our energy security. The bigger picture is that the RFS is working just as Congress intended to diversify our energy supplies and create American jobs.

***Question No. 5: What has been the impact, if any, of the RFS on food prices?***

Although increased use of agricultural commodities for biodiesel production has strengthened commodity values, the real driver of rising food costs continues to be increased petroleum and fuel prices. An examination of monthly soybean oil prices and monthly biodiesel production volumes demonstrates the two variables are not highly correlated. This implies other factors are important determinants on food prices.

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Until we have diversity in our fuel supplies, we will always be vulnerable to inflated global oil prices and the endless cycle of price spikes. Biodiesel is made from an increasingly diverse mix of feedstocks. In fact, the Department of Energy (EIA 22M Biodiesel Monthly Survey) lists seven different feedstocks that are currently being used to produce biodiesel. Most biodiesel producers can shift from one feedstock to another if prices rise or supplies are short. Therefore, the industry's impact on commodity markets is significantly reduced.

In addition, increased biodiesel production helps keep feed costs in check for livestock producers, which can translate to lower prices for consumers. The impact of increased production of biofuels on the livestock sector has generated significant attention. In part this is due to the complexity of commodity products (e.g. soybean oil and soybean meal) that trade globally and the simultaneous occurrence of factors that impact livestock feed prices. An illustrative list would include increased global demand for protein, the value of the U.S. dollar and resulting impact on trade, food labeling regulations (i.e. trans fat labeling and resulting impacts on vegetable oils), the U.S. and global economies, petroleum prices, and biofuels production.

Economic work has been conducted by firms such as Centrec Consulting Group to evaluate the impact of increased biodiesel production on the livestock sector. In 2010, Centrec examined the U.S. biodiesel market and analyzed the impact of decreased biodiesel demand on soybean prices. Utilizing a partial equilibrium model called the Value Chain Analysis (VCA)[8] Centrec evaluated the impact of a single supply or demand factor. For the 2010 analysis, Centrec analyzed a decrease in soybean oil demand for biodiesel – in isolation of other economic sectors. The study concluded,

> "Biofuel production has influenced prices, but due to many factors occurring simultaneously, the degree to which demand for soybean oil for biodiesel production has impacted meal prices is difficult to disentangle. However, the potential scenarios described clearly indicate that if demand for soybean oil for biodiesel production is moderated from current projections with no other factors impacting the soybean complex:
>
> - Soybean oil prices would decrease due to lower demand for oil; the lower input costs for oil end-users would temporarily increase margins until markets adjust and margins return to their long-run average.
> - Soybean production and prices would decline because of the reduced oil demand, and soybean producers would realize lower returns
> - Processing margins would tighten

[8] Developed for the United Soybean Board

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- Soybean meal prices would increase significantly because of the smaller meal supply; therefore, meal end-users would pay higher prices for protein

A similar conclusion was reached by IHS Global Insight in 2011[9] , Informa Economics in 2012[10], and Cardno ENTRIX in 2013[11].

***Question No. 9: What is the scale of the impact of the RFS on international agricultural production and global land use changes?***

U.S. biodiesel production creates no land use changes and when compared to petroleum diesel reduces greenhouse gas (GHG) emissions by well over 50 percent. The US biodiesel industry has been steadily growing over the past several years and existing feedstock sources are already available to meet growing production levels. Therefore, no land use changes, and no significant emissions from those changes, can be associated with biodiesel production. Indeed, in passing the EISA, Congress understood that growing production of Biomass-based Diesel provided substantial reductions in GHG emissions compared to baseline petroleum and sought to preserve those reductions. All lifecycle analyses, including EPA's with international land use changes, show well over 50 percent reduction in emissions.

The structure of RFS-2 clearly demonstrates that Congress understood that existing production of renewable fuels provided significant reductions in GHG emissions compared to baseline petroleum and sought to preserve those reductions. Congress was concerned, however, that new biofuel production may have unintended consequences, and required the EPA consider significant indirect emissions, including significant emissions from land use changes, when calculating a fuel's GHG emission score. Such indirect emissions must be related to the fuel lifecycle. Congress, however, did give EPA some discretion in defining lifecycle emissions, and EPA has authority to find, and in fact did find, that existing biodiesel production has no significant indirect emissions associated with land use changes, because no land use changes are necessary.

The RFS2 final rule implemented the revised statutory definitions and criteria, most notably the new greenhouse gas emission thresholds for renewable fuels and new limits on renewable biomass feedstocks. The rulemaking marked the first time that greenhouse gas emission performance is being applied in a regulatory context for a nationwide program. As mandated by the statute, the GHG assessments consider the full lifecycle emission impacts of fuel production from both direct and indirect emissions, including significant emissions from land use changes.

[9] FAO. 2012. Biofuel co-products as livestock feed - Opportunities and challenges, edited by Harinder P.S. Makkar. Rome.
[10] Informa Economics. 2012. Impact of the U.S. Biodiesel Industry on the U.S. Soybean Complex. December 2012.
[11] Cardno ENTRIX. 2013. Impact of Biodiesel on the Iowa Agriculture Economy. January 31, 2013.

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In carrying out our lifecycle analysis, the EPA took steps to ensure that the lifecycle estimates are based on the latest and most up-to-date science. The EPA determined that biodiesel will meet the required GHG 50% threshold for biomass-based diesel in a range of 57 to 86 percent when compared to petroleum diesel. The assessment also concluded that the increased use of renewable fuels will have important positive environmental, energy and economic impacts for our nation.

Thank you again for the opportunity to submit comments on this important subject. Should you have any questions or need further information, please don't hesitate to call me at 202-737-8801. I can also be reached via email at asteckel@biodiesel.org.

Best Regards,

Anne Steckel
Vice President, Federal Affairs
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NATIONAL CHICKEN COUNCIL

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# Renewable Fuel Standard

# Agricultural Sector Impacts

## House Energy and Commerce Committee

## Comments submitted by the

## National Chicken Council

## Monday, April 29, 2013

NATIONAL CHICKEN COUNCIL

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National Chicken Council's Comments

Renewable Fuel Assessment White Paper

Agricultural Sector Impacts

As the referred white paper notes, "The RFS has unfolded as expected, but in others (respects) it has not." Further, "the overall energy landscape has changed since 2007." The National Chicken Council agrees that it is now prudent and worthwhile to conduct an assessment of the RFS. A number of unintended consequences have complicated the mandate for corn, especially for traditional users of corn. The answers provided by the National Chicken Council to the nine stated questions can provide the committee with information that will allow for the consideration of a more rational and reasonable RFS program.

The RFS has impacted market forces by spurring the rapid 2007-2012 increase in U.S. ethanol production. Significant quantities of corn have been directed to ethanol production and are central to the committee's concerns. If the RFS has played little or no role in impacting feed costs, food prices, and related aspects of agricultural production, marketing, and consumption, then there is little need to reform the current program. If, however, the RFS is a significant driver, is distorting markets, and the market has played a secondary role, then not only is a debate in order, but appropriate Congressional action is warranted to resolve a most burdensome, mandatory program.

With respect to the nine questions stated in the white paper, the National Chicken Council's response is as follows.

**1. What has been the impact of the RFS on corn prices in recent years? What has been the impact on soybean prices? Have other agricultural commodity prices also been affected?**

The RFS has been the single, most important, major driver in increasing corn usage for ethanol production. This unprecedented demand has caused corn inventories to decline to crisis levels for the most recent three years. In a market-driven world, ethanol would be priced competitively with gasoline. That situation has not been the situation since RFS1 was created under the Energy Policy Act of 2005. This Act required 7.5 billion gallons of renewable fuel to be blended into gasoline by 2012. This quantity was, perhaps, manageable given that about 7.5 billion gallons of ethanol is needed for octane enhancement and oxygenation. As such, ethanol was originally worthy of a premium to gasoline. At

current production levels, ethanol is being used for its energy content, which is about 67 percent of gasoline. At current (April 18, 2013) gasoline price levels, ethanol has a market value of about $1.80 per gallon for its energy content. The national average wholesale price was about $2.70 per gallon today. At $1.80 per gallon, an ethanol plant can afford to pay only $3.80 per bushel for corn. At $2.70 per gallon for ethanol, the affordable corn price for an ethanol producer is $6.65 per bushel. This simple, one day, example of how far from true market value the RFS has taken corn prices is typical of what has been driving daily corn prices since 2008.

A secondary and even more troublesome effect has been increased corn price volatility caused by the RFS putting severe pressure on the market. Compared with 2000-2006, corn price volatility has doubled since the RFS became law. The RFS has driven corn use growth faster than production. The result is corn inventories are chronically depleted to minimum levels, causing market prices for corn and other agricultural commodities to gyrate dramatically, depending on the changes in the weather or unpredictable events.

Iowa State's FAPRI econometric model has generated results that suggest that lowering the RFS would have little impact on corn prices. Market forces were the primary driver of corn prices escalating, according to the study's conclusion. However, there are at least two facts in evidence that strongly suggest that the role of the RFS has been the primary force in the rapid development of U.S. corn-based ethanol and the resulting impact on corn and competing crop prices.

First is the simple fact that nowhere in the world have there been any significant biofuel production created without a robust government support programs in the form of mandates and/or taxpayer subsidies. Normal market forces have not been the primary driver. China, Canada, and the EU, once strong proponents of biofuels, have significantly backed away from increasing biofuel production by mandates and subsidies. The U.S. RFS program is by far the most ambitious biofuel mandate in the world, and the most inflexible program.

If biofuels were truly a marketplace phenomenon, driven by entrepreneurs who see market-based opportunities, biofuel industry investments would occur without mandates and subsidies. It is difficult, if not impossible, to find any free market investments happening. Clearly the RFS is the primary driving force behind U.S. ethanol production, and thus, makes the RFS debate of vital and timely importance.

The second fact in evidence is the biofuel sector's strong negative reaction to this debate. If the sector had any faith in its ability to maintain and grow its market based on the merits of its products it would not object strenuously to RFS reform. The leadership of the ethanol industry is fully aware that if the support of the RFS mandates is reduced or eliminated, their business will suffer. This fact further validates the RFS as the key driver behind ethanol industry growth.

Corn is by far the most important food ingredient in U.S. agriculture. Other farm commodity prices are highly correlated with corn. That list includes wheat, soybeans, sorghum, barley, oats, and hay. In addition, by-product feed prices such as distillers' grains, wheat milling by-products, edible fats, meat and bone meal, oilseed meal are greatly influenced by corn prices.

As has been explained, the RFS has driven up corn prices substantially since its implementation. [1/] These effects can be seen in distortions to the theoretical operation of the corn market, in actual changes to corn prices because of the RFS, and in the artificially high demand for corn-based ethanol created by the RFS.

*The Distortions to the Corn Market*

By far the two largest purchasers of corn are feed and food producers and ethanol refiners, although that has not always been the case. The RFS blending requirement has significantly—and artificially—disrupted the market for corn by requiring an ever-growing, predetermined amount be diverted to ethanol use. The RFS increases demand for corn by forcing more users to compete for a supply that has not kept pace with demand. Approximately 15 percent of the 2005/2006 corn crop was devoted to ethanol production. For the 2010/2011 harvest, ethanol production consumed 40 percent of the crop. [2/] Future RFS requirements will most likely consume an even greater percentage of the corn crop and drive corn prices even higher.

This pressure on corn prices is exacerbated by the fixed blending requirements. The fixed blending requirements create an inelastic demand curve for corn purchased by blenders. Blenders must purchase the predetermined amount of corn required by federal law regardless of the price and have only a limited ability to reduce production due to corn price increases. Refiners and blenders may use RINs to offset production, but as of the Fall of 2012, only an estimated 2.6 billion gallons worth of RINS had accumulated during the RFS program, or the equivalent of 19 percent of the 2013 ethanol requirement.

Moreover, conventional wisdom holds that refiners and blenders are likely to hold onto their RINs to offset the "blend wall" that is fast approaching, the point at which ethanol will completely saturate the E10 blend market and gasoline producers will be unable to incorporate the increasingly higher levels of ethanol into their fuels. [3/] Because gasoline producers cannot meaningfully reduce consumption below the RFS mandate as prices increase, [4/] the remaining 60 percent of corn purchasers are forced to absorb 100 percent of the increase in corn prices and adjust to the drastically decreased supply. This imbalance significantly upsets the natural equilibrium that would be achieved, with the result being inefficiently high levels of corn purchased by ethanol refiners and inefficiently low amounts of corn going to feed and food uses. With too little corn to go around and at too high of prices, corn-based food production—especially food animal production—decreases, and the price of these foods increases.

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[1/] The following comments address corn production only.

[2/] Energy Policy Research Foundation, Inc. (EPRINC), *Ethanol's Lost Promise: An Assessment of the Economic Consequences of the Renewable Fuels Mandate*, at 29, Sept. 14, 2012 [hereinafter EPRINC].

[3/] *See* Thomas E. Elam, President, FarmEcon LLC, *The RFS, Fuel and Food Prices, and the Need for Statutory Flexibility*, at 23, July 16, 2012, http://www.nationalchickencouncil.org/wp-content/uploads/2012/07/RFS-issues-FARMECON-LLC-7-16-12-FINAL.pdf [hereinafter Elam].

[4/] *See* Wallace Tyner, Farzad Taheripour and Chris Hurt, *Potential Impacts of a Partial Waiver of the Ethanol Blending Rules*, at 3 (Aug. 16, 2012), http://www.farmfoundation.org/news/articlefiles/1841-Perdue%20paper%20final.pdf [hereinafter Purdue] ("[T]here has been an 8% fall in ethanol production over the past even weeks as the higher corn price puts pressure on ethanol margins. . . . Adjustments might have been greater in the absence of the mandate.").

A byproduct of ethanol production is a substance called dried distillers grain with solubles (DDGs). DDGs is returned to use in animal feed, but it can be used only in limited proportions for certain species and cannot wholly replace corn in animal feed. In particular, DDGs cannot substitute for corn in the diets of non-ruminants like poultry, which cannot break down the fiber in DDGs. Because DDGS can be substituted for corn to a limited degree in some species (but not in poultry production), the price of DDGs tracks that of corn; as corn prices increase, so do DDGs prices. [5/] Even taking into account reclaimed DDGs, 30 percent of U.S. corn production is devoted solely to ethanol. Moreover, although DDGs helps offset to a small extent corn consumed by ethanol production, its overall effect is very small, is limited to certain species, and does little to reduce the price pressures caused by the RFS.

In short, reserving more than 40 percent of the corn crop for mandatory use in ethanol production inevitably increases the price of corn. As a corollary, increased corn prices translate directly into increased food prices, especially the cost of poultry and livestock.

*The RFS Is Increasing 2013 Corn Prices By At Least $2.00 per Bushel, or Nearly 25 Percent*

Numerous economic studies have demonstrated that the RFS significantly increases the price of corn. One way to evaluate the RFS's effects on corn prices is to evaluate what eliminating some or all of the RFS requirements (*i.e.*, removing the arbitrary market distortions) would do to corn prices. As the amount of mandatory ethanol blending under the RFS is decreased, the demand for corn decreases, and corn prices would be expected to decrease, eventually reaching a market equilibrium in which most corn is used for food production, with some lesser quantity devoted to other uses, such as ethanol production, based on market conditions.

An August 2012 report prepared for the Farm Foundation by three Purdue University economists evaluates how an EPA waiver of the ethanol mandate would affect the corn and ethanol markets. [6/] The authors found that reducing the amount of ethanol blended into gasoline in 2013 by even 6.05 billion gallons—about a 44 percent reduction—would reduce corn prices by $2.00 per bushel, a nearly 25 percent reduction. [7/]

The authors modeled five scenarios, determining the expected price of corn under various drought conditions and various ethanol blending levels: [8/]

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[5/] EPRINC at 6.

[6/] See Purdue.

[7/] The authors based their original analysis on three corn production scenarios. Through correspondence with NCC, the authors have provided an updated analysis using the September 2012 USDA projected corn production of 10.73 billion bushels. The updated numbers are consistent with the findings from the original paper. The authors' approach of modeling the effects of a waiver of the RFS is the same as demonstrating the harm caused by the implementation of the RFS in the first place because the waiver scenarios reflect what would have occurred but for the RFS mandates.

[8/] The summer and fall of 2012 saw widespread, severe drought conditions that substantially reduced the overall corn harvest. The Purdue study demonstrated that, even controlling for this severe drought, the RFS still substantially increased corn prices.

Full 2013 RFS before the drought

1. Full 2013 RFS (13.8 BG ethanol requirement) with the drought
2. 11.8 BG ethanol requirement, with the drought
3. 10.4 BG ethanol requirement, with the drought
4. 7.75 BG ethanol requirement, with the drought.

The authors selected these ethanol requirements because they reflected levels that might be reached through the use of RINs, a partial waiver of 25 percent of the ethanol requirement, or both, but "[f]or this analysis, it does not matter whether the reduced blending levels result because of the use of RINs or a partial waiver." [9/] Indeed, the ethanol production simply reflects levels selected by the authors to demonstrate the effect decreased ethanol production would have on corn prices. With this in mind, the third, fourth, and fifth scenarios reflect the corn prices that would result from decreasing ethanol levels 2 BG (14 percent), 3.8 BG (25 percent), or 6.06 BG (44 percent), respectively, from the 13.8 BG level required by the RFS. [10/] These levels are informative because they reflect ethanol production that would still be substantially greater than what would be expected under equilibrium conditions without mandatory production. In other words, without the RFS, there would be even less pressure on the demand for corn due to ethanol production, and corn prices would be even lower.

The authors modeled three drought scenarios—stronger, median, and weaker droughts. USDA crop yield estimates released since the authors wrote their paper indicate the corn crop will fall directly between the strong and median drought scenarios. The authors' model revealed that corn production would respond to reduced ethanol use by decreasing just slightly, while corn prices would drop by $1.99 (23 percent) if ethanol production decreased by 44 percent from the full RFS requirement. The authors' original results are reproduced in Table 1. [11/]

**Table 1: RFS Waiver Effect Simulations from Purdue Study**

| Description | Expectation Before Drought | Drought with 13.8 BG Ethanol | Drought with 11.8 BG Ethanol | Drought with 10.4 BG Ethanol | Drought with 7.75 BG Ethanol |
|---|---|---|---|---|---|
| **Stronger Drought:** | | | | | |
| Corn production (Bil. bu.) | 14.65 | 10.50 | 10.45 | 10.42 | 10.35 |
| Corn used for ethanol | 5.11 | 5.11 | 4.37 | 3.85 | 2.87 |
| Domestic food and feed use | 6.72 | 3.96 | 4.59 | 5.03 | 5.58 |
| Exports | 1.82 | 1.43 | 1.49 | 1.53 | 1.63 |
| Corn price ($/bu.) | 5.26 | 8.57 | 7.89 | 7.45 | 6.58 |
| **Median Drought:** | | | | | |
| Corn production (Bil. bu.) | 14.65 | 11.00 | 10.95 | 10.92 | 10.85 |
| Corn used for ethanol | 5.11 | 5.11 | 5.11 | 3.85 | 2.87 |
| Domestic food and feed use | 6.72 | 4.39 | 5.02 | 5.45 | 6.25 |
| Exports | 1.82 | 1.49 | 1.56 | 1.62 | 1.73 |
| Corn price ($/bu.) | 5.26 | 7.81 | 7.14 | 6.67 | 5.80 |

[9/] Purdue at 7.

[10/] The most relevant comparison is between the projected price of corn with the full RFS in place in light of the drought and the projected price of corn with 7.75 BG ethanol production (*i.e.*, between the second and fifth scenarios). For completeness, all scenarios are shown in the table that follows.

[11/] *Id.* at 8.

| **Weaker Drought** | | | | | |
|---|---|---|---|---|---|
| Corn production (Bil. bu.) | 14.65 | 11.50 | 11.45 | 11.42 | 11.35 |
| Corn used for ethanol | 5.11 | 5.11 | 5.11 | 3.85 | 2.87 |
| Domestic food and feed use | 6.72 | 4.81 | 5.42 | 5.84 | 6.62 |
| Exports | 1.82 | 1.58 | 1.66 | 1.72 | 1.86 |
| Corn price ($/bu.) | 5.26 | 7.02 | 6.36 | 5.89 | 5.02 |
| Note: The corn yields for these three cases are 120, 126, and 132 bu/ac. | | | | | |

Revised to reflect USDA's September 2012 estimated 10.73 billion bushel crop production, a reduction in ethanol production by 44 percent reduces the price of corn by $2.00 per bushel (24 percent) from its full RFS price, as shown in Table 2. [12/] Put differently, the marginal 44 percent of ethanol production caused by part of the RFS directly increases corn prices by $2.00.

**Table 2: Purdue Model with Updated Corn Production Estimates**

| **Description** | **Expectation Before Drought** | **Drought with 13.8 BG Ethanol** | **Drought with 11.8 BG Ethanol** | **Drought with 10.4 BG Ethanol** | **Drought with 7.75 BG Ethanol** |
|---|---|---|---|---|---|
| Corn Price ($/bu.) | 5.26 | 8.19 | 11.8 | 7.06 | 6.19 |

Numerous other studies have recognized the demand for corn by ethanol producers as a major driver of corn and food prices. [13/] A 2011 study demonstrated that the increasing prices of grains in recent years can be accounted for by only two factors: speculation by investors and the increase in corn to ethanol conversion. The authors concluded that the underlying upward trend in prices can be attributed to the increased diversion of corn to ethanol, once the spikes in prices caused by speculation are excluded. [14/]

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[12/] In September 2012, USDA estimated U.S. corn production at 10.73 billion bushels. As the corn production forecasts have steadily decreased in the last three USDA reports, it is likely that corn production estimates will continue to shrink as we move further into 2012.

[13/] Donald Mitchell. Word Bank Development Prospects Group, *A Note on Rising Food Prices* (2008), http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2008/07/28/000020439_20080728103002/Rendered/PDF/WP4682.pdf (finding that 70 to 75 percent of the increase in food prices is due to increased demand for biofuels); Keith Collins, *The Role of Biofuels and Other Factors in Increasing Farm and Food Prices: A Review of Recent Development with a Focus on Feed Grain Markets and Market Prospects* (2008) (using a mathematical simulation to estimate that about 60 percent of the increase in corn prices from 2006 to 2008 may have been due to the increase in maize used in ethanol); John Lipsky, First Deputy Managing Director, International Monetary Fund, Commodity Prices and Global Inflation, Remarks and the Council on Foreign Relations (2008) (estimating that the increased demand for biofuels accounted for 70 percent of the increase in corn prices); Colin Carter et al., *The Effect of the U.S. Ethanol Mandate on Corn Prices*, UC Davis, http://agecon.ucdavis.edu/people/faculty/aaronsmith/docs/Carter_Rausser_Smith_Ethanol_Paper_submit.pdf (estimating that 2010 corn prices were 50 percent greater in log terms than they would have been if U.S. ethanol production stayed at its 2005 level, and that average prices over the period from 2006 to 2010 were 30 percent greater than they would have been had the increase in ethanol production not occurred).; Randy Schnepf and Brent D. Yacobucci, Renewable Fuel Standard (RFS): Overview and Issues (Jan. 23, 2012), http://www.fas.org/sgp/crs/misc/R40155.pdf (finding that "corn prices have trended steadily upward in direct relation to the added growth in demand from the ethanol sector").

[14/] Marco Lagi et al., *The Food Crises: A Quantitative Model of Food Prices Including Speculators and Ethanol Conversion* (2011), http://necsi.edu/research/social/food_prices.pdf.

In particular, the study "suggests that there has been a direct relationship between the amount of ethanol produced and (equilibrium) food price increases." [15/] The RFS is the major force behind the diversion of corn to ethanol production, and the resulting increases in corn price.

Not only has the price of corn increased overall with implementation of the RFS, but the number of spikes in corn prices has also increased. Corn price volatility has more than doubled since 2007. [16/] This instability puts pressure on the food and feed industries as companies try to make production decisions for the future and injects substantial uncertainty into the market. Uncertainty leads to further speculation, so tightening markets makes the situation even worse. Research conducted by the United Kingdom Department for Environment, Food and Rural Affairs (DEFRA) shows that a 50 percent waiver of the U.S. biofuels mandate in the same year as a spike in the global price of course grain could reduce the magnitude of a hypothetical spike in prices by 40 percent. [17/] A 75 percent waiver would result in a 55 percent reduction in the size of the spike. [18/] These results occur because removing U.S. mandates for biofuels makes the entire demand side of the grain market responsive to price, compared to just the food and feed components of demand, so demand from biofuels producers would contract along with demand in the food and feed markets. When the burden of the high demand for corn is shared, there is no driver of such high prices in the food and feed markets. Thus, a waiver of the RFS would significantly relieve producers and consumers of the adverse effects and uncertainty of corn price volatility.

As has historically occurred when the price of corn increases, the current increase in corn price will result in overall inflation in the price of food. The USDA's Economic Research Service has predicted that the increase in the price of corn will first affect the price of beef, pork, poultry, and dairy, while "[t]he full effects of the increase in corn prices for packaged and processed foods (cereal, corn flour, etc.) will likely take 10-12 months to move through to retail prices." [19/]

Finally, as a lynchpin of domestic food production, corn's price also affects the prices of other key commodities that are viewed by farmers as corn substitutes. Due to competition for land on the production end between corn, soybeans, and wheat, the prices of soybeans and wheat track the price of corn. When the price of corn increases, so do the prices of soybeans and wheat. Field corn also competes for land with sweet corn and other vegetables, and an increase in the price of field corn means farmers plant less of other vegetables and the prices of those vegetables increases accordingly.

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[15/] *Id.* at 19.

[16/] Elam at 2.

[17/] Chris Durham et al., United Kingdom Department for Environment, Food and Rural Affairs, *Can Biofuels Policy Work for Food Security?: An Analytical Paper for Discussion*, at 2 (June 2012), http://www.defra.gov.uk/publications/files/pb13786-biofuels-food-security-120622.pdf [hereinafter Durham]. Notably, the European Commission recently announced plans to limit crop-based biofuels to 5 percent of transport fuel due to concerns about diverting too much of the corn supply from food to fuel. Charlie Dunmore, *Exclusive: EU to Limit Use of Crop-Based Biofuels – Draft Law*, Reuters (Sept. 10, 2012).

[18/] Durham at 5.

[19/] USDA, Economic Research Service, *U.S. Drought 2012: Farm and Food Impacts*, http://www.ers.usda.gov/newsroom/us-drought-2012-farm-and-food-impacts.aspx.

*Without the RFS, Demand for Corn-Based Ethanol Would Decrease Substantially to Efficient Market Levels*

Implicit in the analysis of the price of corn under the RFS is the artificially high demand for corn-based ethanol caused by the RFS. Without the RFS in place, ethanol production would drop below even the 7.75 BG level modeled in the Purdue study. The Energy Policy Research Foundation has determined that, without the RFS, ethanol would be blended into gasoline only to the extent necessary as an oxygenate, which is about 400,000 barrels per day, or 6.1 BG annually. [20/] Ethanol production would decrease because, while ethanol is useful as an oxygenate, its poor energy levels per gallon relative to gasoline make it too expensive to use solely as a fuel source. [21/] Refiners and blenders would use only the amount of ethanol necessary to replace MTBE as an oxygenate. Thus, without the RFS, ethanol would still be used in transportation fuel, but at much lower levels, and only for its ancillary benefits, not as an actual energy source.

Further, the RFS is saturating the ethanol market, and the lowest-value uses of ethanol will decrease absent the RFS. The U.S. exports a significant amount of corn ethanol each year—1.2 BG in 2011. [22/] If it made economic sense to blend this ethanol into the U.S. fuel supply, refiners would not be exporting it. Without the RFS, corn use would shift away from this and other lower-value uses toward higher-value use in food and animal feed. [23/]

**2. How much has the RFS increased agricultural output? How many jobs had it created? Have any jobs been lost? What is the net impact on the agriculture sector?**

Although the weather disaster caused unfavorable crop conditions that resulted in reduced 2012 crop production, the data from 2012 can be used to help answer this question. Since the RFSII actually arrived in 2008 total corn, wheat and soybean production have not grown by any measurable account. In fact, corn production declined 10.8 percent, soybean production increased 1.6 percent, and wheat production was down 9.2 percent. Comparing 2011 with earlier years such as 2008, corn production was up 2.2 percent, soybeans were up 4.2 percent, and wheat was down 20 percent. While 2012

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[20/] EPRINC at 10. A barrel contains 42 gallons. Elam at 10. Ethanol is efficiently used in gasoline in small quantities as an oxygenate and to increase octane levels. EPRINC at 2. Ethanol is a much less efficient substitute as an actual energy source in fuel, containing only about 67 percent as much energy than gasoline on a per-volume basis. Elam at 3.

[21/] Ethanol is efficiently used in gasoline in small quantities as an oxygenate and to increase octane levels. EPRINC at 2. Ethanol is a much less efficient substitute as an actual energy source in fuel, containing only about 67 percent as much energy than gasoline on a per-volume basis. Elam at 3. Ethanol would have to sell at 67 cents to the dollar against gasoline for its in gasoline solely as a fuel source to be economical. When the decreased fuel efficiency of ethanol (because each gallon of ethanol provides less energy) is considered, which could raise issues with meeting fuel-efficiency standards and pollution requirements, ethanol becomes an even less appealing substitute for gasoline and may require an even greater discount before used widely in fuels.

[22/] Elam at 4.

[23/] Notably, the European Commission has already decided to limit the amount of food-crop-based biofuels in motor fuel to 5 percent to reduce pressure on food commodity prices and out of concern about emissions and greenhouse gases. Charlie Dunmore, *Exclusive: EU to Limit Use of Crop-Based Biofuels – Draft Law*, Reuters (Sept. 10, 2012).

weather has played a role, since the current RFS was created total major crop production has not materially increased.

The jobs question is somewhat difficult to answer. Looking objectively at jobs created by various corn-using industries the answer is that increased ethanol has undoubtedly destroyed more jobs than it created.

Using a recent 2013 Renewable Fuels Association study, there were 11,971 jobs in the nation's ethanol companies in 2012. According to a 2009 American Meat Institute study, there are 524,500 direct jobs in meat and poultry processing. Both estimates are for direct employment only, and do not include indirect and induced effects.

Including direct, indirect and induced jobs, the Renewable Fuels Association study claims a total of 383,260 total jobs that are affected by ethanol production. This implies that every ethanol plant job supports, in a meaningful way, another 32.5 jobs in the economy. That "jobs multiplier" of 32.5 is about 10 times what is generally accepted by most economists.

The similar 2009 American Meat Institute study determined a jobs multiplier of 2.4 with total direct, indirect, and induced jobs of 1,269,500. The bottom line is that just the meat and poultry portion of food production supports a much larger labor force than the entire fuel ethanol industry.

Scaling jobs to the amount of corn used also shows large differences. A million tons of corn used to produce meat and poultry supports over 3,600 direct jobs. These jobs do not include the hundreds of family farmers who raise the chickens. That same volume of corn used by the ethanol sector supports only 145 jobs. Including indirect and induced employment (as claimed by the respective industry associations), one million tons of corn supports 5,117 ethanol-related jobs and 8,119 meat and poultry-related jobs. The ethanol industry claim is based on a jobs multiplier that is significantly higher than generally accepted.

To the extent that the RFS has diverted corn from food to fuel production, a very significant number of jobs have been lost. It is not just current jobs that were lost, but job creation opportunities that were not realized because food production was constrained or eliminated.

From 2007 to 2012, over 27.9 million tons of combined corn and distillers' grains were removed from total food production, of which meat and poultry processing is only a portion. Ethanol producers' corn use, net of distillers' grain returned to food production, increased about 40.6 million tons over this same period. Given the vastly different direct job multipliers, far more direct jobs, existing and potential, were destroyed in meat and poultry processing than were created by ethanol producers. To find a conclusion counter to the one stated here requires assumptions and a selection of data that most analysts would not find acceptable.

**3. Was EPA correct to deny the 2012 waiver request? Are there any lessons that can be drawn from the waiver denial?**

No, the waiver petition should have been granted. EPA's claim at least implied that the act set a very high bar for granting a waiver is a very judgmental argument. In essence, the bar apparently requires the U.S. economy to grind to a halt before a waiver can be granted. If that scenario was in fact the actual situation required, the United States would be forced to address much more severe problems than the cost of food caused by the RFS.

Record-high corn prices, distress in the food sector, corn exports that declined by 50 percent, the closing of numerous ethanol plants, and skyrocketing D6 ethanol RIN values are all symptoms of severe economic distortions caused by the RFS. Market forces should have been allowed to allocate the limited corn supply, rather than a government mandate continuing to put greater demand pressure on a very limited supply of corn.

One important and primary lesson that was hopefully learned is that the EPA should not have the sole power to judge waiver requests. As one observer cited, it is the Environmental Protection Agency or the Ethanol Protection Agency? It is important to remember that EPA has actually denied two waiver requests – both made and supported by governors of states with significant agricultural economies – and in doing so has established an impossible standard for granting a waiver request. If an RFS is maintained, there must be clear and manageable standards for waiving quotas in light of dynamic economic situations.

**4. Does the Clean Air Act provide EPA sufficient flexibility to adequately address any effects that the RFS may have on corn price spikes?**

No, it is somewhat obvious that it does not provide the necessary and sufficient operating authority, at least according to how EPA interprets its legislative authority. The current mechanism is overly cumbersome, too inflexible, and does not fairly weigh the effects on all affected parties. The Clean Air Act should be amended or the entire conventional fuel RFS should be eliminated.

The two experiences with EPA's treatment of RFS waiver requests has made clear that the Clean Air Act does not provide EPA sufficient guidance on how to implement an RFS program in an economically responsible manner. EPA has interpreted the Clean Air Act's authorization to issue a waiver when the Administrator determines that "implementation of the requirement would severely harm the economy or environment of a State, region, or the United States" in a way that ensures a waiver will never be granted. 24/ In 2008, the state of Texas petitioned EPA to issue a 50 percent waiver of the RFS based on severe harm to the economy of Texas. In rejecting the petition, EPA offered its preliminary interpretation of the statutory requirements for issuing a waiver: EPA required (1) a showing that implementation of the RFS program itself is the cause of the severe harm; (2) a generally high degree of confidence that the implementation of the RFS "would" severely harm the economy of a state, region, or the United States; and (3) that the potential harm to the economy be "severe," which, although not fully defined, falls short of "extreme." 25/ EPA also noted that the party requesting the waiver should

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24/ Clean Air Act, Sec. 211(o)(7), 42 U.S.C. § 7545..

25/ EPA Notice of Decision Regarding the State of Texas Request for a Waiver of a Portion of the Renewable Fuel Standard, 73 Fed. Reg. 47168, 47170–72 (Aug. 13, 2008).

show severe harm to the entire economy of a state, region, or the United States, not merely one sector of the economy. 26/

As applied, this standard—which is not mandated by the Clean Air Act—has proven malleable enough that the agency can always justify its refusal to grant a waiver, whether by disregarding contrary economic impact studies in favor of conclusory assumptions, deciding that reasonable economic predictions do not offer enough certainty of harm, or some other means. If our nation's fuel policy is going to pit filling gas tanks against feeding citizens, Congress needs to provide the clear statutory guidance necessary to ensure that affordable food prices always prevail.

**5. What has been the impact, if any, of the RFS on food prices?**

The RFS impact on food prices is discussed extensively in the paper submitted with these comments, (please see "The RFS, Fuel and Food Prices, and the Need for Reform" by Dr. Tomas E. Elam, President of FarmEcon LLC, January 8, 2013). Since the RFS was most fully implemented in 2008, food price inflation has gone from slightly slower than general inflation to 60 percent higher than general inflation. Food affordability that had been increasing steadily since 1950 suddenly reversed that trend and food started to become less affordable. Higher food costs are damaging the economy's ability to create jobs, and holding down consumers' ability to increase discretionary spending. As stated at the beginning of this response, much of the reversal in food affordability is the result of the RFS and the market distortions it has caused.

The RFS has driven up food prices significantly, effectively taxing grocery dollars to pay for artificially inflated ethanol demand. And that tax falls hardest on those least able to afford it, food-insecure families struggling to put nutritious meals on the table each day. The effects of the RFS can be seen in both an overview of the food production chain and in specific economic analysis of food prices.

*Effects of Corn Prices throughout the Food Production Chain*

Corn is integral to our food supply, as approximately 75 percent of foods on grocery store shelves contain corn, corn byproducts, or corn processed-foods or is derived from an animal raised on corn. The vast majority of corn planted in the United States is field corn, which is used in applications such as livestock feed, cereal products, alcohol, and processed foods including corn sweeteners, corn-based vegetable oils, corn starch, and corn flour. Field corn is used for ethanol production. A very small percentage of corn acreage is devoted to sweet corn, which is consumed directly as food. Because field corn and sweet corn compete for the same acreage, their prices track one another; as the cost of field corn rises, sweet corn becomes more expensive, too.

The National Research Council estimates that an increase in the price of corn of 20 to 40 percent results in a 2 to 4 percent increase in the prices of corn-based food products at the retail level. 27/ USDA's

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26/ *Id.* at 47172.

Economic Research Service states that on average, a 50 percent increase in corn prices results in a 1 percent increase in overall food prices (including in this average food without corn in its supply chain), with particular categories of food, including meat, poultry, and dairy, affected more severely. 28/ More generally, as the price of a commodity increases, about 15 percent of that increase is passed on to retail prices for products that use that commodity as an ingredient. 29/

The U.S. corn supply is used extensively in producing meat, poultry, and dairy products. Corn feeds the nation's livestock and poultry and comprises 94 percent of the grains fed to animals. 30/ For every $1 increase in the price of corn per ton, feed costs increase 45-67 cents per ton. 31/ Further, feed represents the dominant cost in producing animal products. For example, for broiler chickens, feed costs constitute 69 percent of live production costs. 32/ Meat, poultry, and dairy producers are heavily dependent on corn as a feedstock, thereby linking increased corn prices with increases in meat, poultry, and dairy prices.

Short-term spikes in corn prices are particularly devastating for poultry and livestock producers due to their longer production cycles and inflexible animal diets. 33/ Livestock and poultry producers face a production lag that makes it difficult to adjust quickly to increased feed costs by reducing animal numbers. For example, the time between breeding parent stock to retail sales of fresh product from the resulting offspring ranges from 10 weeks for broiler chicken meat to about 10 months for milk and pork to about 30 months for beef. Thus, production decisions for broiler products consumed today were made nearly three months ago (more than two years ago for beef products), leaving livestock and poultry producers unable to respond to price increases in the interim. Livestock and poultry producers are thereby held captive to increasingly high corn prices.

Further, while livestock such as cattle can switch (in part) to other diets when the cost of grains increases, poultry and swine are more reliant on high-energy grains and have a limited ability to use other energy sources. For example, during the two years from 2006 to 2008 when feed costs increased by two-thirds, resulting in an 80 percent increase in total live-production cost, the ratio of corn in broilers' diets held constant. Over those two years, the cumulative effect of the increased feed costs to the broiler industry exceeded $7.8 billion. 34/ Poultry producers, with nearly three-month production

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27/ Committee on Economic and Environmental Impacts of Increasing Biofuels Production, National Research Council, *Renewable Fuel Standard: Potential Economic and Environmental Effects of U.S. Biofuel Policy* 133 (2011), http://www.nap.edu/openbook.php?record_id=13105&page=1 [hereinafter National Research Council].

28/ USDA, Economic Research Service, *Food Price Outlook: Highlights*, http://www.ers.usda.gov/data-products/food-price-outlook/highlights.aspx; Hibah Yousuf, *Corn Price Spike: Food Inflation a "Real Threat*," CNN Money, July 18, 2012, http://money.cnn.com/2012/07/18/investing/corn-prices-food-inflation/index.htm.

29/ USDA, Economic Research Service, *Food Price Outlook: Highlights*, http://www.ers.usda.gov/data-products/food-price-outlook/highlights.aspx.

30/ National Research Council at 134.

31/ *Id.*

32/ *Id.*

33/ National Research Council at 135-36.

34/ M. Donohue and D.L. Cunningham, *Effects of Grain and Oilseed Prices on the Costs of U.S. Poultry* Production, 18 J. APP. POULTRY RES. 325-337 (2009).

lags and long-term growing contracts, cannot meaningfully adjust to the rapid changes in feed prices caused by the RFS. Both poultry and livestock producers are severely harmed by increases in the price of their primary feedstock.

The U.S. chicken industry has suffered in the years since the implementation of the RFS, in contrast to the industry's average annual growth rate of 4.0 percent and historical resiliency even during difficult economic times. In 2009, U.S. broiler production decreased by 3.8 percent, the largest decrease since 1970. In 2012 broiler production again decreased. These recent trends demonstrate that an historically resilient industry has seen the greatest decrease in growth (indeed, it has shrunk) in more than forty years during the implementation of the RFS, when it has seen demand for one of its primary inputs drastically and artificially increased. Because of the importance of corn in so many aspects of food production, the entire food industry—and ultimately, the consumer—is suffering because of the RFS.

*Food Prices are Higher Directly Because of the RFS*

The RFS has unmistakably driven up food prices. As with its effects on the price of corn, the effects of the RFS on food can be easily seen by looking at what eliminating some or all of the RFS would do to the price of food today.

As explained in response to Question 1, the RFS drives up the price of corn by more than $2.00 per bushel. 35/ A decrease in the price of corn by $2.00 per bushel would significantly alleviate pressures on both consumers at the grocery store and the food, livestock, and feed industries. Given the vital role of corn in U.S. food production, as the price of corn decreases, so do the prices of meat, poultry, and dairy products, and the foods that contain corn-based sweeteners, starches, flours, and oils, as well as substitute products such as wheat and soybeans and any foods made using them.

A marginal decrease in corn price of 24 percent, based on a reduction in the price of corn by $2.00 per bushel, would result in a decrease of approximately 2.4 percent in retail food prices. 36/ USDA estimates that food prices will increase 3–5 percent this year. In other words, less than half of the price increase caused by the RFS requirement is equivalent to half-to-nearly-all of the projected increase in the price of food. 37/

Even more dramatically, a decrease of $2.00 in the price of corn per bushel is equivalent to a decrease of $71.43 per ton of corn, which results in feed costs that are $32.14 to 47.86 lower per ton for

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35/ In reality, the RFS drives up the price of corn by significantly more than $2.00 per bushel; the studies modeled only up to a 44 percent reduction in the ethanol mandate, which would still distort the market into producing more corn-based ethanol than it otherwise would. If anything, this discussion represents a very conservative analysis of the effects of the RFS on food prices.

36/ *See* National Research Council at 133.

37/ Additional studies, including those conducted by the Energy Policy Research Foundation, FarmEcon LLC, and the United Kingdom's Department for Environment Food and Rural Affairs have similarly demonstrated that the RFS causes severe economic harm by driving up corn prices. *See generally* EPRINC; Elam; Chris Durham et al., United Kingdom Department for Environment, Food and Rural Affairs, *Can Biofuels Policy Work for Food Security?: An Analytical Paper for Discussion* (June 2012), http://www.defra.gov.uk/publications/files/pb13786-biofuels-food-security-120622.pdf.

poultry. 38/ The broiler chicken industry uses 1.25 billion bushels of corn each year. 39/ Savings of $2 per bushel of corn would amount to $2.5 billion in annual savings to the broiler industry, which would result in lower food prices.

Finally, increased costs of corn affect the entire production chain from farm to table. As processing plants find themselves unable to keep pace with the increasing costs of grain, the growers and farmers who produce poultry and livestock suffer. And when poultry processing plants shutter, the economic effects ripple through the entire local community, reaching those employed both directly and indirectly by the plant. In total, the chicken industry directly employed about 251,100 employees in 2011 and indirectly generated an additional 759,150 jobs in the supplier and ancillary industries, including feed mills, hatcheries, and trucking. 40/ Thus, the total direct and indirect employment by the U.S. chicken industry in 2011 was about 1,010,250 workers, producing wages of $47.3 billion and generating $197.6 billion in economic activity. At the local level, a single processing plant is supported by about 300 farm families. The direct effect of the increased price of corn is to put local farmers and workers employed by the chicken industry out of business.

**6. What role could cellulosic biofuels play in mitigating the potential effects of the RFS on corn prices?**

If cellulosic-based biofuels were to actually become a commercially-viable energy source, the impact would be to lessen the demand pressure on the corn market. Unfortunately, it is very difficult to envision a time in the future when cellulosic-based biofuels will become a reality in the energy market place. Assuming there is the break-through in the technical aspect of turning cellulosic material into a biofuel, like ethanol, at an economically-competitive cost, there remains another major hurdle. That challenge involves transporting, storing, handling, and processing a tremendous quantity of raw material to produce a relatively limited amount of ethanol. Removing one half of the corn stalks from harvested corn fields will not only prove quite costly, but also impact the availability of organic matter in the soil. It is possible that the removal of this organic matter will affect the yields of the crop planted following such removal. Such a continual practice may not prove to be sustainable and, therefore, renewable. This issue raises the question of "What is really renewable?" Does putting over 200 pounds of nitrogen per acre on a corn field qualify corn to be considered "renewable?

At one time corn-based ethanol was to be a transitional source of biofuels until cellulosic-based biofuels became commercially viable. As the dream of cellulosic-based biofuels continues to remain a dream,

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38/ These figures are based on estimates that for every $1 increase in the price of corn per ton, feed costs increase 45-67 cents. There are ostensibly a standardized 56 pounds of corn per bushel and 2000 pounds in a ton. Although a bushel is generally viewed as containing 56 pounds of corn, a bushel is technically a volumetric measurement. As the quality of corn decreases, so does its average weight per bushel. The current year's corn crop is likely to weigh in at 54 pounds per bushel. This would drive up feed prices even more (and the RFS would even further distort market pricing) because livestock and poultry are fed by weight, not volume, meaning more bushels of corn would be required to feed each animal.

39/ This estimate is based on the facts that in 2011 8.34 billion broilers were produced with live weight of 48.28 billion pounds. It requires 106 billion pounds or 53 million tons of feed to produce that quantity of broilers, including broilers, pullets, and breeders. Given that two-thirds of the chicken feed ration is corn and corn by-products, 35.5 million tons or more than 1.25 billion bushels of corn were fed to chickens in 2011.

40/ The Poultry and Egg Industry Economic Contribution Study: 2012, http://chicken.guerrillaeconomics.net/public/res/Poultry%20Impact%20Methodology.pdf.

the argument that the RFS burden will be lifted from corn is less and less debated. While it may be worthwhile to pursue the necessary technical break-through for cellulosic-based biofuels, there is a legitimate question regarding the hundreds of millions of dollars being invested to build plans that may or may not event produce cellulosic-based biofuels. To the extent that federal, state, and local governments guarantee and/or underwrite the financing for these plants, the question becomes even more of an issue.

**7. What impact are cellulosic biofuels expected to have on rural economies as the production of such fuels ramps up?**

Since it is highly unlikely that cellulosic-based biofuels will come into commercial operation before 2022, it would be very speculative to assess the impact on rural economies. To the extent that a cellulosic-matter crop could be produced on land now considered unproductive for traditional agricultural crops and would not negatively impact the environmental features of such land, the development of cellulosic biofuels could be seen as beneficial.

**8. Will the cellulosic biofuels provisions succeed in diversifying the RFS?**

Theoretically, the answer is yes. But we explained in Question 7 the likelihood of cellulosic biofuels achieving a meaningful level of commercial production remains quite doubtful, especially before 2022. When Congress approved the Energy Independence and Security Act of 2007, the view of and hopes for cellulosic-based biofuels was apparently based on something other than a full and careful analysis of the science and economics needed to bring such a biofuel to commercial fruition.

**9. What is the scale of the impact of the RFS on international agricultural production and global land use changes?**

Relatively high corn prices and similarly high prices for competing crops compared with somewhat more stable production costs have provided a very strong stimulus for farmers around the world to produce more grains and oilseeds. Clearly, the impact of the RFS has not just been on U.S. agriculture. With more and more land being shifted from grassland, pastures, and land having environmental concerns, the issues involved become more apparent and raises the question of the real cost of certain unintended consequences. In hindsight it is somewhat obvious the RFS schedule was too aggressive and lacked the needed options for a more workable mechanism for re-consideration.

It is the National Chicken Council's hope that the responses received to this white paper can be the basis for a much warranted re-consideration of the RFS.

<u>Concluding Note</u>

Attached is a February 5, 2013 power point presentation prepared by Dr. Thomas E. Elam, President of FarmEcon, LLC. This presentation, "The Renewable Fuel Standard: Real Costs, and Need for Reform" will provide the Committee with additional information that should be helpful in assessing the answers to the nine questions.

Attachments

April 29, 2013

The Honorable Fred Upton
Chairman
Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington, DC 20515

The Honorable Henry Waxman
Ranking Member
Committee on Energy and Commerce
2322A Rayburn House Office Building
Washington, DC 20515

Dear Chairman Upton and Ranking Member Waxman:

On behalf of the more than 38,000 corn grower members of the National Corn Growers Association, we appreciate the opportunity to comment on this second White Paper, "Agricultural Sector Impacts," from the House Committee on Energy and Commerce. Corn farmers have responded to the increased demand of ethanol from the Renewable Fuel Standard (RFS) by producing more corn. Additionally, in the last 30 years, corn production has improved on all measures of resource efficiency, by *decreasing* per bushel: land use by 30 percent, soil erosion by 67 percent, irrigation by 53 percent, energy use by 43 percent and greenhouse gas emissions by 36 percent.[1] All of these improvements have continued despite the increased demand of corn for ethanol.

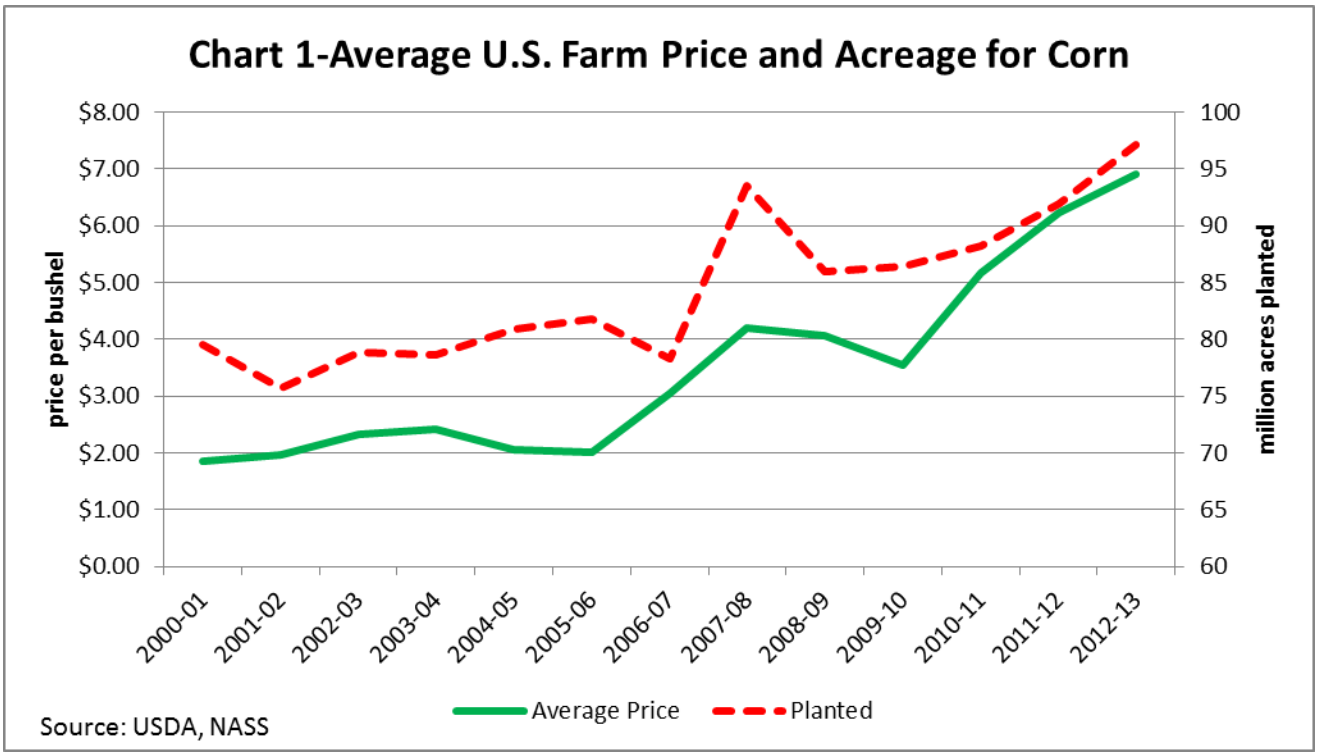
Congress enacted the RFS in a thoughtful and careful manner by ensuring that careful checks and balances were in place to enact the policy. While it was impossible to determine *a priori* if the checks and balances were going to work as planned, we believe the RFS has been a monumental success for agriculture and for the nation. We appreciate the opportunity to comment on the impact of the RFS on: commodity products including corn, agricultural output and economics, RFS flexibility, food prices, cellulosic feedstock and global impacts.

**1. What has been the impact of the RFS on corn prices in recent years? What has been the impact on soybean prices? Have other agricultural commodity prices also been affected?**

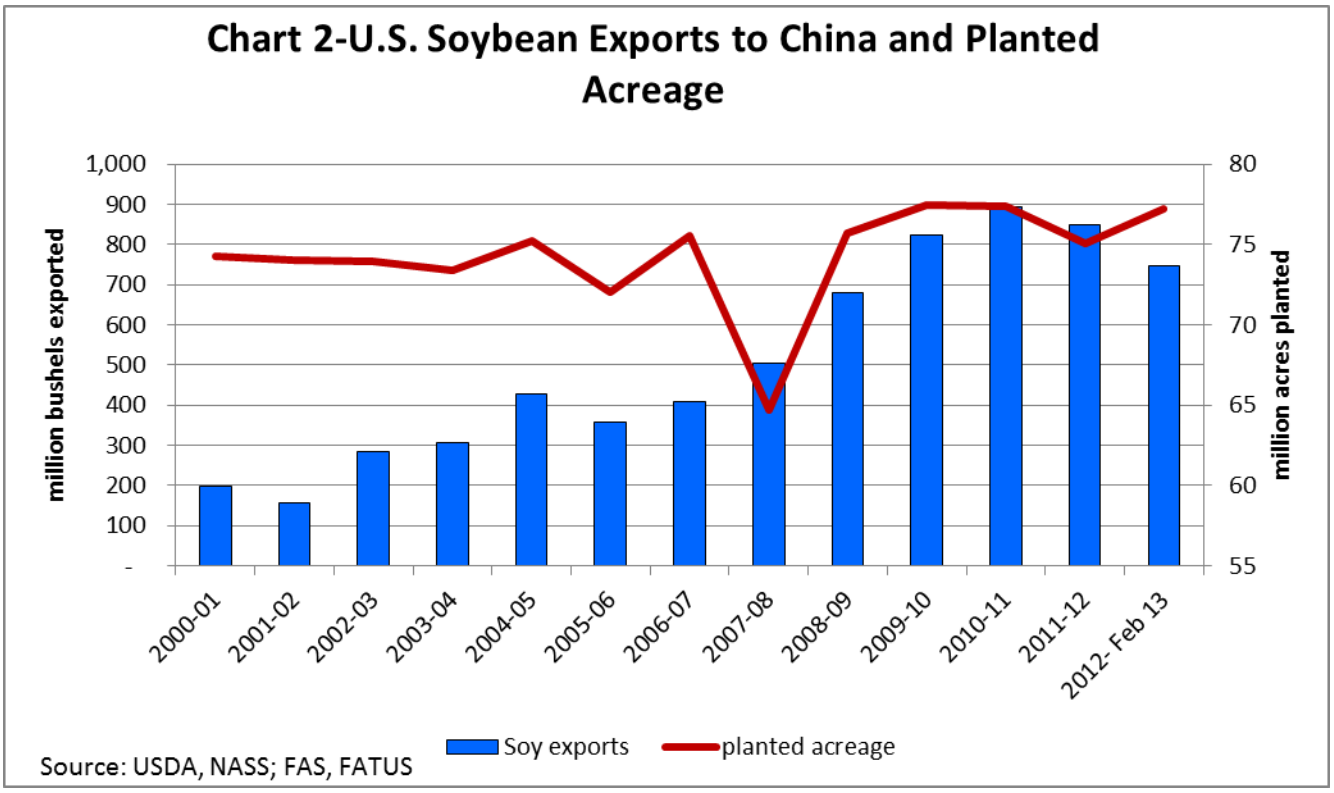
It is evident that corn prices have risen since the introduction of the RFS and the expansion of RFS II. As Chart 1 shows, average U.S. corn prices have more than doubled since 2002, 5 years prior to RFS II. However, corn prices like all commodities are driven by a number of factors, including the dramatic increase in the use of commodities as an investment vehicle after the 2007

[1] "Environmental and Socioeconomic Indicators for Measuring Outcomes of On-Farm Agricultural Production in the United States" Field to Market: The Keystone Alliance for Sustainable Agriculture, July 2012.

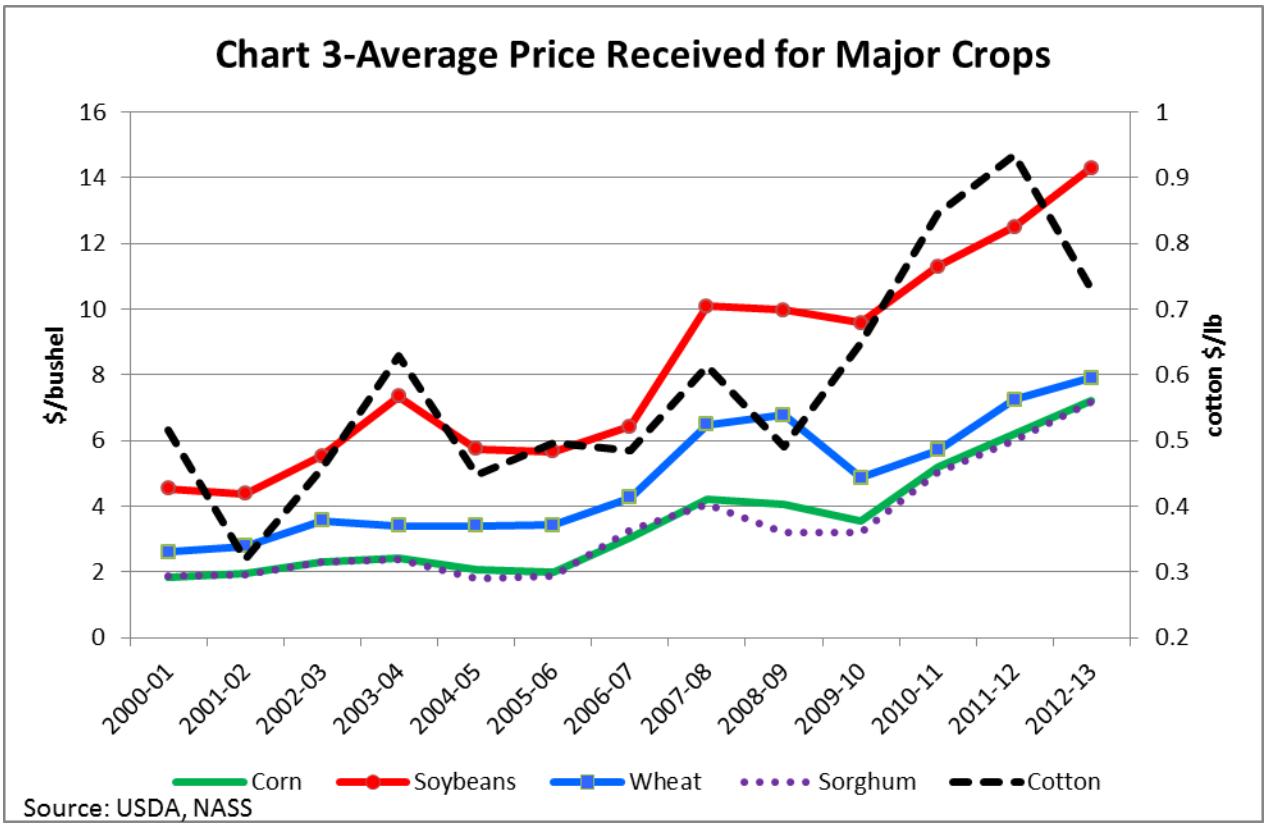
stock market crash, the increase in demand (both domestic and international) for corn and other grains, and the most recent drought. A closer examination of each of these factors in more detail is revealing. Although several factors have driven up corn prices, farmers in the U.S. and globally have all responded in the same manner by increasing corn acreage planted. It must also be pointed out that the overwhelming majority of the increased corn acreage came from changing crop mixes, notably a decrease in wheat acreage, not introduction of new land.




As mentioned, one of the leading factors in commodity price increases is increased demand from both domestic and international markets. Nowhere is this more prominent than with soybeans, and the primary driver here is exports to China. Chart 2 illustrates U.S. soybean exports to China. In each of the last 6 years, China has set a new record for soybean imports from all sources. Correspondingly, U.S. soybean exports to China have increased dramatically since the implementation of the RFS II, and have set records each year prior to 2011-12. This increased demand has driven up the price of soybeans. This fact, which is too often overlooked, has a dramatic impact on corn production and availability. Since corn and soybeans often compete for the same acreage, there was tremendous potential for additional corn planting had the increased Chinese soybean demand not existed. For example, during the 2010-11 crop year the U.S. exported 895 million bushels of soybeans to China. With a national average yield of 43.5 bushels/acre, that export demand consumed the soy production of 20.6 million acres. Had that land been planted to corn instead, it would have produced an additional 3.15 billion bushels of corn (152.8 bu/acre average yield), the equivalent of 62.7 percent of the corn processed into fuel ethanol that year.




The impacts listed above are not limited to corn and soybeans. On most farms, growers have planting options, and the eventual crop mix is determined by both agronomic requirements as well as economic returns. All the other major primary crops (wheat, cotton, and sorghum) have seen increases in average price since the introduction of the RFS II. Although each of these crops has a unique set of drivers, many of the same factors determine their price just as in corn or soybeans. Price increases for multiple crops are depicted in Chart 3.




**2. How much has the RFS increased agricultural output? How many jobs has it created? Have any jobs been lost? What is the net impact on the agricultural sector?**

The RFS and other market forces have increased the demand for agricultural products. Certain crops, like corn, have dramatically higher yields than others, for example wheat or soybeans. A decrease in wheat acreage, due to shifts to corn or soybeans, has led to tighter supplies of wheat and subsequently higher wheat prices. But as was illustrated above, a significant increase in export demand for other agricultural products has occurred simultaneously to the increased demand for corn from the RFS. This is not limited to just soybean exports to China. For example, over this time period, red meat exports have also significantly increased. Overall, agricultural output has risen, some driven in response to the RFS, others driven in response to a growing global middle-class demand for protein.

Conservatively, direct employment in the ethanol industry accounts for 12,000 jobs.[2] Accurately measuring indirect employment is more difficult. However, two areas that cannot be overlooked when measuring indirect impacts are the farm equipment industry and the public sector in rural America. As stated above, while it is difficult to assess how much of the increase in farm revenue is attributable to RFS demand versus increased export demand, farm income has risen. Despite the negative effects of the ongoing recession in the manufacturing sector, agricultural

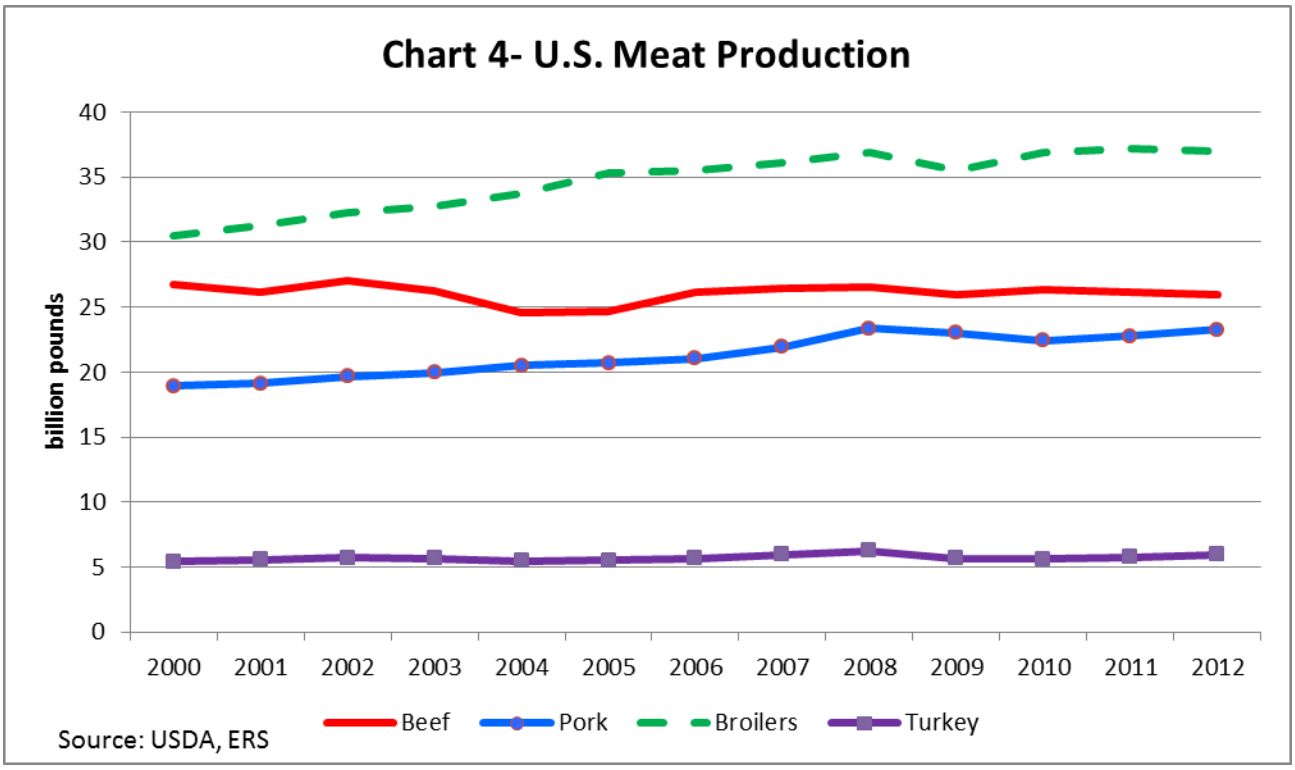
[2] Urbanchuk, John M., "Contribution of the Ethanol Industry to the Economy of the United States," prepared for Renewable Fuels Association. January 31, 2013.

equipment manufacturers have been largely immune to the downturn. This is solely because as farm income has risen, farmers have expanded and recapitalized their operations. A large part of this recapitalization is new equipment purchases. Likewise, as farm returns and income have risen, land prices have also risen. This has expanded the property tax base in rural America which is vital to funding schools, roads, and other public services. Finally, according to the USDA, total net agriculture income has risen since the passage of the RFS. In 2006, average farm income was $57.4 billion. In 2012, farm income was $112.8 billion, a 97 percent increase. As the table indicates while farm income has increased, this increase was not solely in the crop sector. Livestock receipts have increased over this time period as well.

Table 1-Income Statement for the U.S. Farm Sector (billion $)

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012F | 2013F |
|---|---|---|---|---|---|---|---|---|
| Crop Receipts | 122.1 | 150.1 | 175.0 | 168.9 | 179.6 | 208.3 | 219.6 | 216.3 |
| Livestock Receipts | 118.5 | 138.5 | 141.6 | 120.3 | 141.6 | 166.0 | 171.7 | 176.5 |
| Gross Income | 290.2 | 339.5 | 377.7 | 343.3 | 365.6 | 428.5 | 446.5 | 481.1 |
| Total Expenses | 232.8 | 269.5 | 292.6 | 280.3 | 285.2 | 310.6 | 333.7 | 352.9 |
| Net Farm Income | 57.4 | 70.0 | 85.1 | 63.0 | 80.4 | 117.9 | 112.8 | 128.2 |

It is nearly impossible to prove that any jobs were lost because of the RFS. Although there has been criticism from the livestock sector regarding the negative impacts caused by the RFS, meat production has not dramatically fallen. Although there has been a slight downturn in beef production this is explained by the persistent drought in the southern plains, not the RFS. Chart 4 shows the annual meat production in the U.S. If, as some critics claim, the RFS has been overly detrimental to the livestock industry, annual meat production should have declined post-RFS. This can also be used as a proxy for employment in the meat sector. A decline in meat production would have resulted in a loss of jobs. Conversely, increased meat production would be indicative of increased sector employment. This is not to say some companies did not bear the brunt of the change, but overall the sector appears to have increased production.




3. **Was EPA correct to deny the 2012 waiver request? Are there any lessons that can be drawn from the waiver denial?**

Yes, EPA reached the correct decision in denying the 2012 waiver requests. NCGA's position on the waiver was submitted for EPA consideration to Docket ID No. EPA-HQ-OAR-2012-0632 dated October 11, 2012. In 2008, EPA received similar requests to waive the RFS. At that time, EPA established that petitioners must demonstrate that severe economic harm arising from the RFS could be demonstrated. In support of this demonstration petitioners should 1) show harm to the entire economy, not just one sector, 2) that this harm was caused directly by the RFS, and 3) waiving the RFS would provide relief. As we stated in our comments to the EPA "We believe the burden of proof for 'severe harm to the economy' falls on the petitioner. We believe the petitioners have failed to establish this proof…"

4. **Does the Clean Air Act provide EPA sufficient flexibility to adequately address any effects that the RFS may have on corn price spikes?**

Yes. In enacting the RFS, Congress included multiple safeguards ensuring EPA sufficient authority to manage the RFS in a way consistent with driving increased usage of renewable fuels while being sensitive to the economies of a state or region.

Section 211(o)(7) of the statute sets out EPA's authority to waive the RFS mandate (in whole or in part) if the Administrator, in consultation with the Secretary of Agriculture and the Secretary of Energy, determines that implementation of the RFS would *severely* harm the economy or environment of a State, a region, or the United States. The authority requires EPA to take formal

public comment and make a determination within a statutorily prescribed period of time whenever a state or an obligated party petitions EPA, as well as when the EPA Administrator initiates the process herself. In providing this authority, Congress balanced the need for certainty in the RFS program (to ensure that it achieves the goals of supporting development of renewable fuel production and use in the U.S.) with flexibility to address situations where the RFS could be a cause of *severe* economic harm.

The statute hits this proper balance in two important ways. First, it requires EPA, USDA, and DOE to take an economy-wide look at the impact of the RFS to determine whether it is directly causing *severe* harm and that reducing the RFS mandate would provide relief from the harm. This ensures that the RFS isn't simply used as a scape-goat, or a proxy for larger market issues (i.e., drought, energy prices, global demand, market speculation) and that it considers the local, state, regional, and national benefits of the domestic renewable fuels industry in any economic analysis. Second, the statute allows both states and obligated parties to petition for a waiver. One could argue that allowing obligated parties to petition for a waiver is ripe for potential abuse in that repeated waiver petitions (no matter how lacking in merit) could be employed as a tool to purposefully undermine the certainty of the RFS. That said, Congress accepted that risk when it expanded the provision in 2007 to allow obligated parties the right to petition for a waiver in addition to a state.

EPA's implementation of this larger waiver authority ensures a thoughtful analysis of the RFS's role in any petition to waive the RFS based on economic grounds and provides those petitioning with clear metrics that it must show in order to be granted such a waiver. To date, EPA has properly ruled that the RFS has not resulted in severe economic harm to a state, region or the U.S. that would be alleviated with a waiver of the RFS.

**5. What has been the impact, if any, of the RFS on food prices?**

According to the USDA, across all commodities, the farm share of the food dollar is 15.5 cents for 2011. This is below the average of 16.1 cents per dollar for the time period 1993-2011. Because the farmer is getting a smaller percent of the food dollar, it is unlikely that commodity prices alone or a factor like the RFS are large contributors to food price inflation.[3]

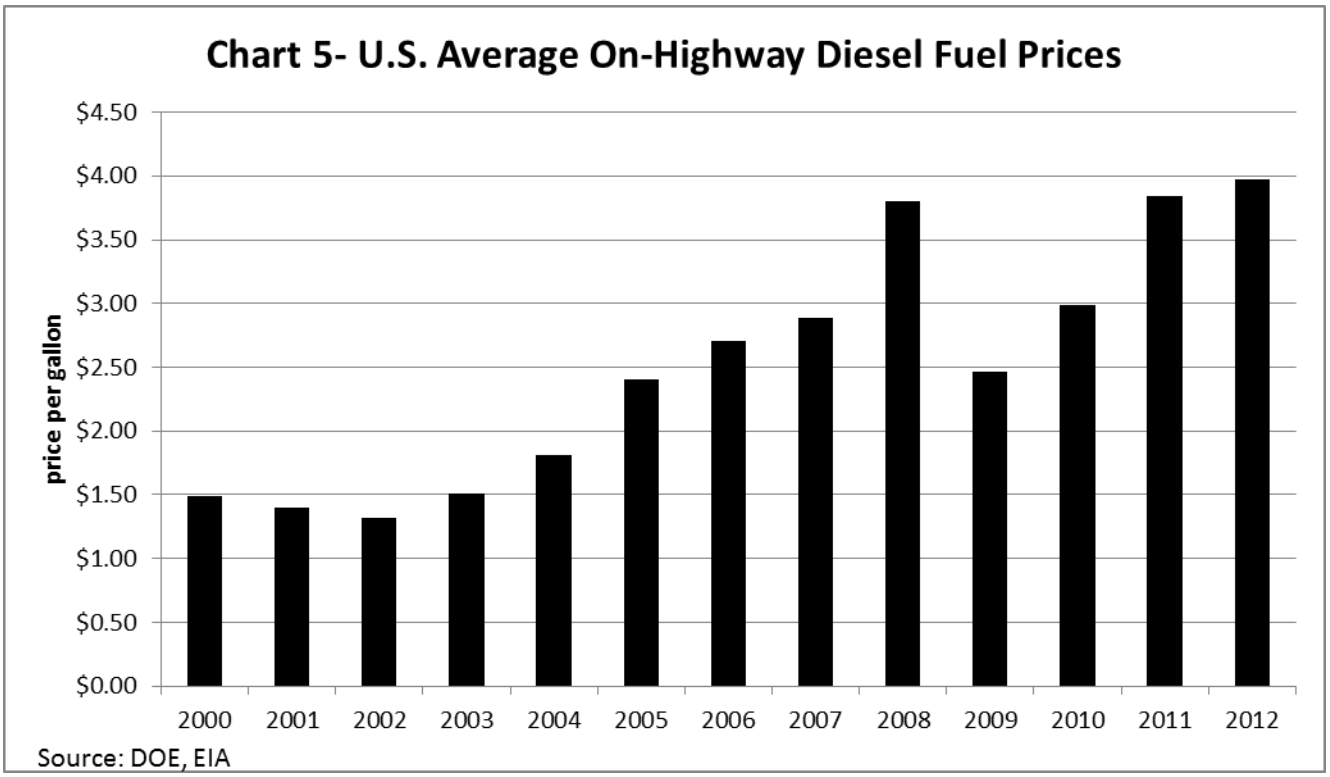
As we have previously established, commodity prices, not just corn, have increased following passage of the RFS. These price increases are a result of several factors, increased corn demand for fuel ethanol being only one of those factors. However, corn and all feedstuff prices have increased since 2007, and this has had a negative impact on the cost of livestock production. But livestock producers, like grain farmers, are "price takers," in that they sell a commodity and have to accept a market price. This means no single producer is large enough to move the market, nor are they able to pass increased costs of production onto the next player in the marketing chain. As demonstrated above, meat production has expanded in almost every sector since the passage of the RFS. Fortunately for livestock producers, during this same period of increased feedstuff costs, the U.S. has been expanding export markets for meat products. Increased exports have driven up the cost of meat and livestock and thereby covered much of the higher costs of production. One exception to this is the beef sector. Because of the drought and subsequent

[3] http://www.ers.usda.gov/data-products/food-dollar-series/food-dollar-application.aspx.

herd liquidation, the U.S. beef supply has significantly contracted. Although there has not been a dramatic decrease in beef production, that is anticipated as a result of the recent liquidation.

The recent price spike in corn and other commodities is largely attributable to three years of weather-related below-trend yields. Because of the 2012 drought causing an approximate 25 percent below trend national yield average, a large price increase occurred. The price of corn as measured on the Chicago Board of Trade peaked in July 2012. The futures price of corn has decreased from those July highs, despite the fact that the size of the corn crop continued to decrease, throughout the remainder of the growing season.

While the cost of production, partially due to higher feedstuff costs, has risen, a more likely explanation of the increased food costs are factors outside of agriculture. Specifically, rising diesel fuel and labor costs have greatly impacted food prices. All food sold in a grocery store is delivered by truck. In 2007, the average price of a gallon of diesel fuel was $2.88; by 2012 that had increased to $3.97, a 37.8 percent increase (Chart 5). Likewise, while U.S. labor wages may have stagnated due to the on-going recession, other labor costs, most notably health care has not. Unlike farmers, meat packers, wholesalers, and food retailers are not "price takers" and increased costs of production, can more easily be passed onto consumers. As the USDA data cited above indicates, the vast majority of the retail food dollar arises after products leave the farm.



6. **What role could cellulosic biofuels play in mitigating the potential effects of the RFS on corn prices?**

Domestically produced cellulosic biofuels, whether from corn stover, grasses or wood-based resources, will likely have negligible effects on corn prices. The industry continues to gradually implement the technologies to enable durable profitability. A more near-term and direct impact on corn prices is the effective use of processed corn stover in cattle diets. For decades, beef and dairy producers have harvested the above-ground corn plant to make corn silage for use in feed. More recently, producers have advanced their agronomic practices by first harvesting corn for grain only and then following with a process to sustainably collect a portion of the remaining corn plant, or stover. The stover is chopped and processed to create a new cattle feed that competes effectively with the economic and nutrient value of corn. The processed stover feed can displace 20% of the corn in the diet.[4] At full market adoption, that is the equivalent to freeing up approximately 2 billion bushels of corn (over 10% of an average 15 billion bu harvest) for other market uses.

Cellulosic biofuels can play an important role in providing additional feedstock diversity in renewable fuels production in the U.S. Existing ethanol facilities are continually looking for ways to incorporate cellulosic feedstocks into their existing operations such as corn fiber and stover. Processes such as these will yield more biofuel per acre planted. In the case of corn oil production, a valuable co-product in the ethanol production process, enhanced feed components with distillers grains sold to livestock producers are available. Additionally, the development of a dedicated energy crop to biofuel production will provide additional economic opportunities for farmers, especially on marginal lands, which will also further diversify biofuel production.

7. **What impact are cellulosic biofuels expected to have on rural economies as the production of such fuels ramps up?**

The growth of cellulosic biofuel production in the United States will provide similar economic opportunities in a broader swath of rural America in a similar magnitude of the existing renewable fuels industry. The existing industry supports tens of thousands of jobs and has generated billions of dollars of farm assets around the country.

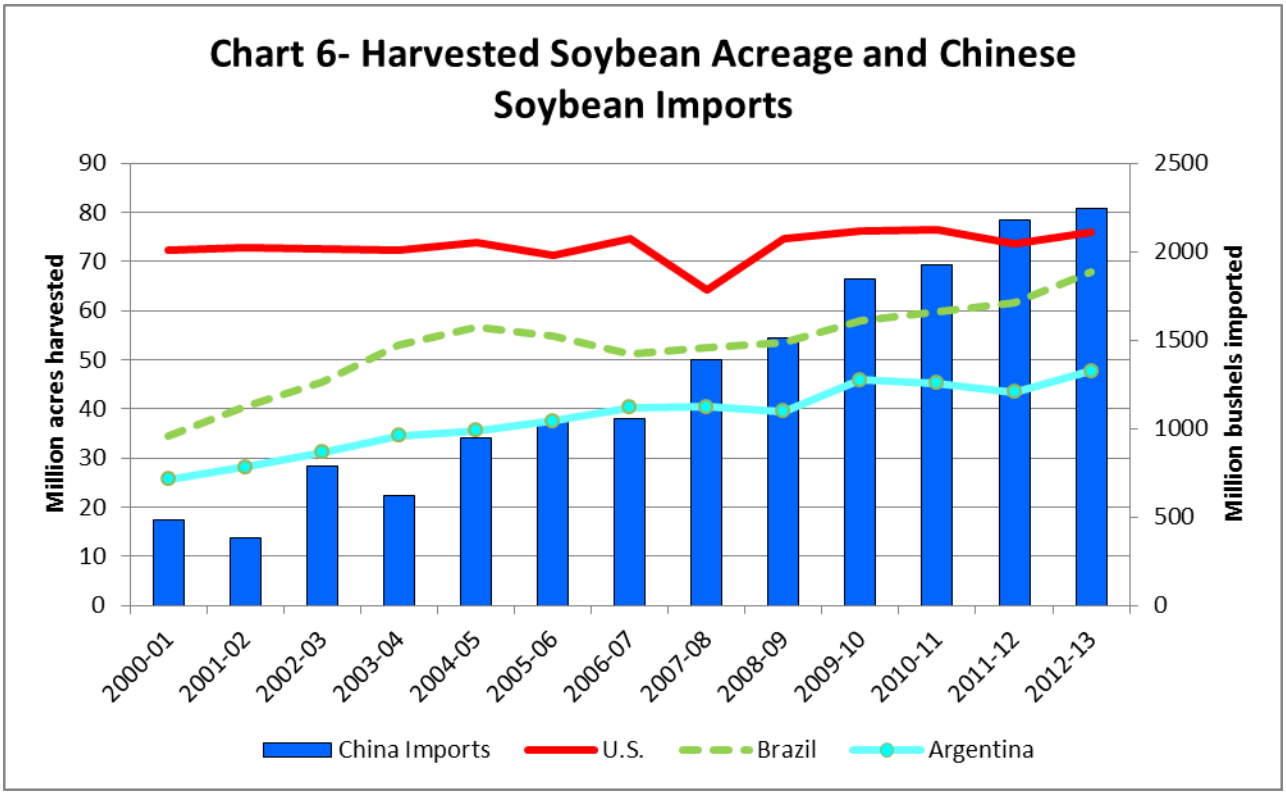
8. **Will the cellulosic biofuels provisions succeed in diversifying the RFS?**

Yes, as long as Congress stays the course. The RFS sends a critical investment signal that the U.S. is committed to developing alternatives to petroleum. It provides investors with confidence that a market will exist for cellulosic biofuels if they commit resources to build facilities. Importantly, investments are being made and projects are coming on line. The cellulosic biofuels industry has secured billions in private investment and now has projects under development in more than 20 states.

[4] Archer Daniels Midland press release, Feb 16, 2011, referencing six-month Iowa State University trials.

9. **What is the scale of the impact of the RFS on international agricultural production and global land use changes?**

Since the passage of RFS II, the science on indirect land use change (ILUC) has been steadily evolving. In short, ILUC states: if more corn is grown in the U.S. to accommodate the RFS, this corn will displace other crops such as soybean acreage elsewhere in the world. According to the ILUC concept, the carbon released from bringing this new land into production must therefore be attributed to corn ethanol. However, as we have shown earlier, there has not been a decrease in U.S. soybean acreage. With the exception of 2007, U.S. soybean acreage has been higher each year post-passage, than any year prior to RFS passage (see Chart 2). We show that any increase in South American soybean acreage over this time has been driven by the Chinese export market, not the displacement of U.S. soybeans in favor of corn for ethanol, reference Chart 6.




Since the RFS was implemented, much work has and is being conducted to model and evaluate land use change (LUC). Various factors go into the assessment of emissions resulting from LUCs including, but not limited to: land type, soil carbon, yield-price elasticities, ethanol co-product and crop residue feeding substitutions. The overwhelming evidence supports much lower values attributed to LUC than when the RFS II was enacted due to optimizations of models and updated data utilized for these calculations. For instance, a recent publication by Purdue

University reviewed several LUC emission factor models that properly account for soil carbon changes in land cover and tillage practices resulting in much lower emissions than other models.[5]

Another important variable is yield-price elasticity, which refers to the response of farmers to price signals. The economic land use change models used in LUC analyses indicate that higher demand for corn due to biofuel production will stabilize or at times increase corn prices. However, recent research confirms that higher commodity prices actually mitigate land use impacts because growers (in response to higher corn prices) invest in more productive technologies.[6]

Another debate, that has the potential to reduce the impact from LUC, centers around the accounting method for emissions over time. Researchers have been assuming that biofuel production will only last for 30 years and therefore the LUC models have been "amortizing" emissions over this time period. However, much longer biofuels production periods (50 years for instance) are likely. Separately, recent peer-reviewed research by the University of Illinois at Chicago has shown that a different emissions accounting method, taking future land use needs for food into account, substantially reduces emissions associated with biofuel production.[7]

Finally, emerging practices and technologies have been shown to further reduce land demands from biofuel production. Most noteworthy is the emerging practice of stover removal for animal feed. If acres that deliver corn to ethanol plants also remove stover for feed, then this animal feed product does not need to be grown on separate acres. A simplified way to gain insight on the co-product impact of stover provides the following example: A corn field with a yield of 160 bu/acre produces 4.5 tons of corn and approximately an equivalent amount of corn stover. If 50% or 2.25 tons of that stover can be sustainably removed for feed (a reasonable removal rate for many corn growing areas) this is equivalent to producing an extra 80 bushels of corn on that acre (assuming an equal substitution for stover of corn in animal diets).

As previously mentioned U.S. farmers have responded to higher commodity prices by expanding production. This fact is not unique to farmers, but similar responses have been observed in other countries. Chart 7 shows the growth in global (Rest of the World) production of primary cereals before and since the passage of the RFS. In each crop, with the exception of sorghum, Rest of the World production has significantly increased. Sorghum production unlike the other cereals has only shown a slight increase after 2007. Clearly whatever the driver, farmers around the globe have responded to higher commodity prices and have increased output.

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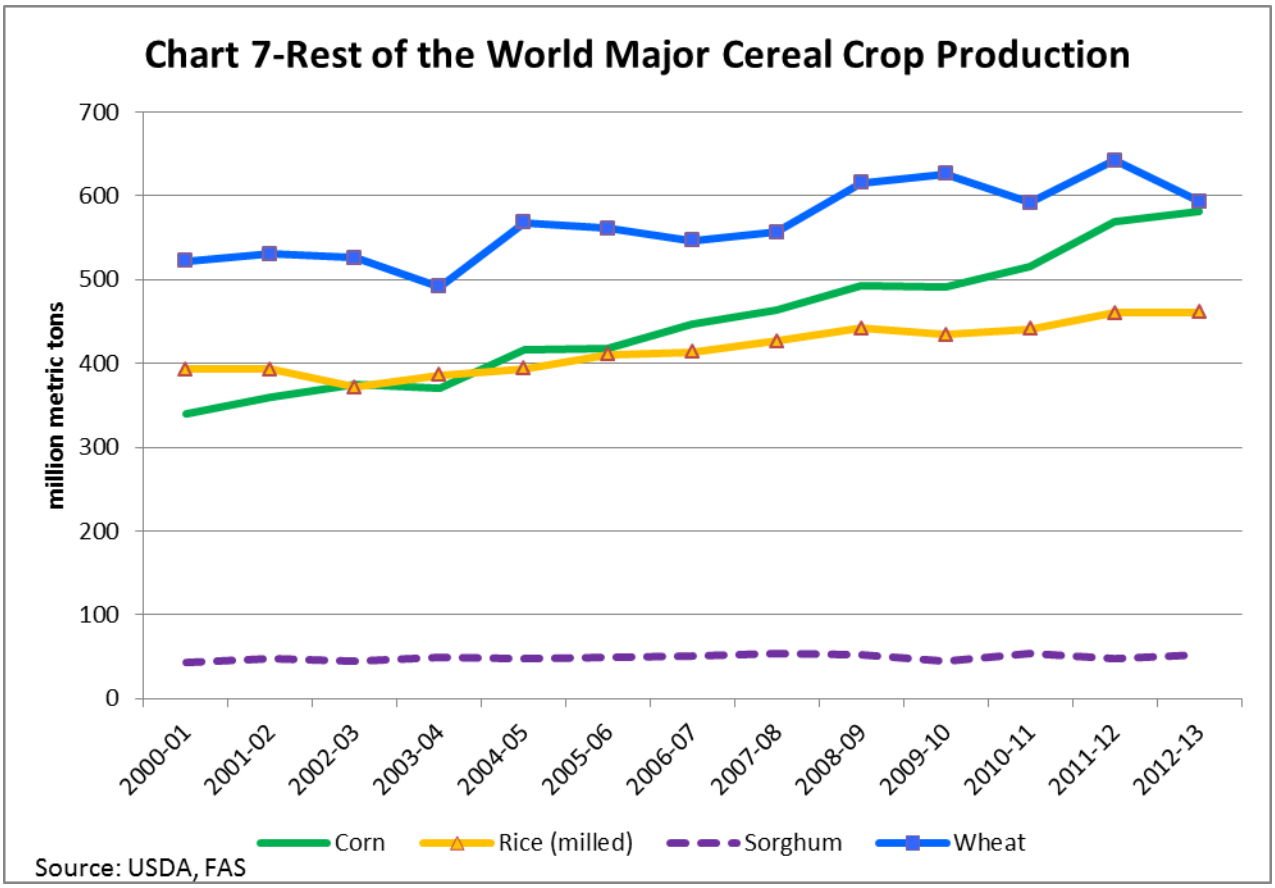
[5] Taheripour, F. and Tyner, W. (2013). "Induced Land Use Emissions due to First and Second Generation Biofuels and Uncertainty in Land Use Emission Factors." *Economics Research International* volume 2013 article ID 31578. Available http://dx.doi.org/10.1155/2013/315787.

[6] Goodwin, B., et al. (2012). "Is yield endogenous to price? An empirical evaluation of inter- and intra-seasonal corn yield response." *Research in Agricultural and Applied Economics*. Available: http://purl.umn.edu/124884.

[7] Kloverpris, J. and Mueller, S. (2012). "Baseline time accounting: Considering global land use dynamics when estimating the climate impact of indirect land use change caused by biofuels." *Int. J Life Cycle Assessment Assessment.* Available online DOI 10.1007/s 11367-012-0488-6.

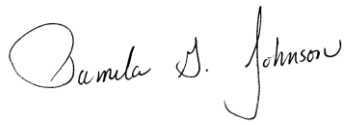



Several academic investigations have been conducted looking at the true impacts of biofuels on international food prices. In a recent report by Pangea[8], which conducted an extensive analysis of food price transmission in the international markets to sub-Saharan Africa, the concluding remark summarizes their finding regarding the impacts of biofuels on the agricultural market: "The biofuels debate in Europe and beyond must be focused on the true challenges to sustainable bioenergy production, use and trade. Pointing the finger incorrectly, as demonstrated by the price analysis in this report, at allegedly negative impacts on African food security due to biofuels mandates outside the region only serves to inhibit the opportunities for development of a true bioeconomy in Africa and around the world. African food prices are impacted negatively by issues such as systemic lack of investment in agriculture and infrastructure, postharvest losses and climate change, but links between biofuels mandates and rising African food prices are weak at best. The focus should instead be on strengthening agricultural production in Africa so developing economies can at last achieve lasting economic development and end poverty." Data analysis with the report documents that biofuel production has not caused food spikes nor shortages. In fact, if the maize surplus in 2010 had been better managed, and used for bioethanol for cooking and electricity, the biofuel sector would have counteracted the falling price trend and stabilized planted area and production the following year.

[8] Pangea (2012) "Who's Fooling Whom?" The Real Drivers Behind the 2010/11 Food Crisis in Sub-Saharan Africa.

In summary, the RFS has increased national energy security by creating a market for *renewable* fuel as a substitute for non-renewable petroleum-based fuel, thereby accelerating the nation's progress toward a low greenhouse gas (GHG) emissions economy. In addition, the RFS has contributed to the reduction of petroleum imports. Corn producers have played a critical role in the RFS by producing the feedstock for ethanol production. This has been done while concurrent changes in export demand, weather, fuel costs and economic changes have also occurred. All of these changes have had varying levels of impact on the price and availability of corn for the nation and the globe. As with any resource, proper checks and balances are necessary to ensure sustainable production. The same applies in this instance. Corn farmers stand ready to sustainably provide the resources needed to attain the goals of the RFS.

Sincerely,



Pam Johnson, President
National Corn Growers Association

NRF's Chain Restaurant Division
nccr
National Council of Chain Restaurants

April 29, 2013

The Honorable Fred Upton
Chairman

The Honorable Henry Waxman
Ranking Member

Committee on Energy and Commerce
U.S. House of Representatives
RFS@mail.house.gov

Dear Sirs:

The National Council of Chain Restaurants (NCCR) appreciates this opportunity to provide comment on the questions you pose in your White Paper Series on the Renewable Fuel Standard. Please see below our response to your Paper 2, Agricultural Sector Impacts, released April 18, 2013.

Thank you for considering these comments and please do not hesitate to contact us for more information.

Sincerely,

Robert J. Green
Executive Director

Scott Vinson
Vice President

National Council of Chain Restaurants
325 7th St NW • Suite 1100 • Washington, DC 20004
202.626.8183 • 202.626.8185 fax • www.nccr.net

The National Council of Chain Restaurants (NCCR) appreciates this opportunity to provide comment on the questions you pose in your White Paper Series on the Renewable Fuel Standard. By way of background, NCCR is the leading trade association exclusively representing chain restaurant companies. For more than 40 years, NCCR has worked to advance sound public policy that best serves the interests of restaurant businesses and the millions of people they employ. NCCR members include the country's most-respected quick-service and table-service chains. NCCR is a division of the National Retail Federation, the world's largest retail trade group.

The Committee's review of the Renewable Fuel Standard (RFS) is both timely and necessary, as we have seen the emergence of damaging and unintended consequences since the RFS was instituted as part of the Energy Policy Act of 2005 and expanded again as part of the Energy Independence and Security Act of 2007. The impacts of the law have been dramatic and negative, including a massive diversion of the nation's primary agricultural commodity – corn – away from food so that it can be burned as fuel. This diversion has been costly not only for American businesses and consumers, as our comments below will show, but also for the populations in developing countries where shortages of maize and land use changes resulting from biofuels production has led to avoidable, and even life-threatening, hunger and hardship.

From NCCR's perspective, we are very concerned with the negative impact the RFS has had on wholesale prices for key food commodities, including corn, soybeans, beef, poultry and pork, among others. Since the inception of the RFS, prices for these commodities, which are mainstays of the American diet, have increased significantly, which has adversely impacted stakeholders in foodservice, including chain restaurants. NCCR commissioned a study, conducted by PricewaterhouseCoopers (PwC), to look specifically at the effect the RFS has had on chain restaurants and their small business franchisees. That study will be referenced and detailed in our responses that follow.

Again, we thank you for this opportunity to comment.

We respectfully submit the following responses to these questions from the White Paper:

*1. What has been the impact of the RFS on corn prices in recent years? What has been the impact on soybean prices? Have other agricultural commodity prices also been affected?*

*3. Was the EPA correct to deny the 2012 waiver request? Are there any lessons that can be drawn from the waiver denial?*

*5. What has been the impact, if any, of the RFS on food prices?*

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Response to Question 1

The RFS' conventional ethanol category is currently the largest part of the overall RFS mandate.[1] Corn is the primary feedstock in this category. Although the United States is the world's largest producer of corn, a progressively larger share of total annual U.S. corn production has been used for ethanol manufacture each year since the RFS became law in 2005. Ethanol's share of U.S. corn production has risen from under 15% in 2005 to almost 45% in the 2011-2012 marketing year.[2] This steep and dramatic increase in the diversion of corn away from agricultural uses and to the production of ethanol has exerted upward pressure on the price of corn.[3] Since the inception of the RFS in 2005 the price of a bushel of corn has risen over 300%.[4] So far in 2013, corn prices have averaged $7 a bushel. In the ten years preceding the RFS, corn prices averaged only $2.50 per bushel.[5] Even without rigorous economic analysis, it is obvious that the RFS' mandate to commandeer a portion of the nation's corn supply for ethanol fuel is having an impact on the price of corn. Basic supply and demand economics demonstrate that when supply of a good remains constant and demand for it increases, its price will rise.[6]

Unfortunately, higher corn prices cause higher prices for all foods in the supply chain. Much of the corn grown in the U.S. – at least that which is not diverted to the manufacture of ethanol fuel and its derivatives – is used as inputs in the production of other commodities. Prior to enactment of the RFS, use of corn as food, seed and feed for the production of livestock and poultry accounted for the majority of that use.[7] Indeed, the importance of corn to the food supply chain in the United States is hard to overstate. Not only does corn constitute most of the feed used in animal agriculture, but it is also used heavily in the processing of modern-day consumer foods sold in supermarkets and served at restaurants across the country. Scarcely a food label can be found that does not include corn as an ingredient.

Moreover, higher corn prices have served as an inducement to convert more agricultural acres to corn production, as would be expected. As available acres have been diverted from other crops to corn, the

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[1] The conventional ethanol mandate for 2013 is 13.8 billion gallons which, from a total RFS mandate of 16.55 billion gallons, accounts for some 83% of the RFS.
[2] U.S. Department of Agriculture, Economic Research Service Feed Grains Database, August 2012.
[3] "The Impact of Ethanol Use on Food Prices and Greenhouse-Gas Emissions," Congressional Budget Office, April 2009.
[4] Energy Information Administration, Annual Energy Outlook 2004 and 2012.
[5] Congressional Research Service, Renewable Fuel Standards (RFS): Overview and Issues, March 13, 2013 pp. 19-23; 21-22.
[6] For the years the RFS has been in effect annual U.S. corn production has been relatively constant. http://www.indexmundi.com/agriculture/?country=us&commodity=corn&graph=production.
[7] U.S. Department of Agriculture, Economic Research Service Feed Grains Database, August 2012.

prices of those crops, including soybeans, have also risen. This domino effect has occurred throughout the agricultural system, leading to higher prices for nearly all food commodities.

For the chain restaurant industry, the consequences have been significant and sustained. The price of numerous food commodities purchased and utilized by the industry has risen dramatically since the inception of the RFS. In 2012 NCCR commissioned the firm of PwC to examine the effect of the RFS mandate on the input costs of chain restaurants. The results were issued in a report entitled "Federal Ethanol Policies and Chain Restaurant Food Costs."[8] The report is available online at http://www.nccr.net/flipbook/index.html#/0.

PwC reviewed existing private sector, academic and government studies on the impact of the RFS mandate on ethanol production and the price of corn and other agricultural commodities.[9] PwC then "combined these estimates with survey information on commodity purchases by chain restaurants to estimate the overall impact of the RFS mandate on chain restaurant input costs."

PwC developed economic models to estimate the change in corn prices attributable to changes in corn ethanol production based on supply and demand sensitivities to quantity and price. The models estimate the change in corn and other commodity prices that would result if the RFS were eliminated, using an approach similar to that used by Federal Reserve researchers. The PwC analysis reveals very significant increases in the price of corn and other commodities attributable to the RFS. PwC provided estimates under two scenarios rather than only one. This method allowed for an estimate to be provided across a range. For example, the PwC report estimates that the increased corn ethanol use attributable to the RFS, when the corn ethanol mandate is fully phased-in in 2015, will result in a higher price per bushel of corn of up to 26.8%. For wheat, the estimate of higher prices is up to 12.1%. For soybeans the estimate is up to 15.7%, and so on across a range of food commodities.[10] The food commodities analyzed included corn, wheat, barley, soybeans, potatoes, beans, rice, sugar, beef, poultry, pork, eggs and milk.

PwC took into consideration the fact that, at least for part of the time during which the RFS has been in effect, two other federal policies relating to biofuels, and specifically ethanol, were also in place. Those two policies, the Volumetric Ethanol Excise Tax Credit (VEETC) and the ethanol import tariff, both expired at the end of 2011. PwC provided estimates of the VEETC's impact on food commodity prices and concluded that it was negligible. Research cited by PwC concluded that the import tariff's impacts were also negligible.[11] Therefore, the federal biofuels policy most responsible for the increased demand for conventional corn ethanol and, subsequently, the higher price of corn and a host of other food commodities is the RFS.

Response to Question 3

[8] PwC, October 9, 2012. http://www.nccr.net/flipbook/index.html#/0.
[9] *Id.* at 1.
[10] PwC, Table 3, Price Impacts on Other Food Commodities from Eliminating RFS, p. 15.
[11] *Id.* at 15-16.

NCCR believes the EPA should not have denied last year's request from ten State governors for a waiver from the RFS' mandate for conventional (corn) ethanol. NCCR submitted detailed comments for the record at that time, and they are available to view at: http://images.magnetmail.net/images/clients/NRF_/attach/NCCRCommenttoEPADocketEPAHQOAR20120632.pdf.

As stated in those comments, NCCR believes "the current and 2013 corn ethanol mandates are unjustified given current drought conditions and the severe economic damage that has been suffered by animal agriculture producers, all other non-corn agricultural growers, and major stakeholders in the U.S. food system including the chain restaurant industry."

The lesson that can be drawn from this episode is that the RFS is clearly broken. The mandate waiver was written into the law to provide a safety-valve for precisely the type of situation that last year's severe drought presented – extreme hardship caused by the RFS' production mandates. EPA's denial of the governors' waiver request proves that the RFS does not work as it was intended.

Response to Question 5

The RFS has contributed significantly to the rise in food prices since its inception. Again, the PwC report is instructive. After providing estimates of higher food commodity prices attributable to the RFS,[12] the PwC report applied it across several (20) categories of wholesale food purchases by a representative sample of chain restaurant companies based on 2011 purchase data.[13] PwC extrapolated the data out across the broader chain restaurant industry. These calculations yielded the estimated value of food commodity purchases by chain restaurants.[14] PwC reported that, "on a per-restaurant basis, spending on primary food inputs amounted to $181,869 for the average quick-service restaurant and $192,552 for the average full-service restaurant."[15] Under the two scenarios noted earlier, PwC concluded that the RFS mandate raises chain restaurants' primary food purchase costs up to 10%. For the quick-service restaurant industry, this projection equals up to $2.5 billion a year, every year. For full-service restaurants, the estimated higher cost is $691 million. All told, the higher costs imposed by the RFS on the chain restaurant industry for its wholesale food prices total up to $3.2 billion a year.[16]

When viewed from the perspective of an individual chain restaurant franchisee, the numbers are even more startling. For the average quick-service chain restaurant franchisee, the higher food costs imposed by the RFS can amount to over $18,000 a year, and over $17,000 for the average full-service franchisee. These numbers are enormously consequential for the chain restaurant industry, which operates on very thin margins.

[12] PwC, Table 3, p. 15.
[13] PwC, p. 17.
[14] PwC, Table 4, p. 18.
[15] *Id.*
[16] PwC, p. 19.

It is important to note that chain restaurant businesses cannot simply raise menu prices in order to cope with the higher food costs imposed by the RFS. The restaurant industry is extremely competitive and customers are highly sensitive to price. Therefore, many chain restaurants and their small business franchisees have been forced to try to absorb the higher food costs caused by the RFS, especially during the recent recession when Americans have had less discretionary income to spend. Indeed, a recent report from the Congressional Research Service seems to confirm the fact that the RFS' costs are not being passed-on to consumers in a significant way, as it estimated that by 2022 the RFS will raise annual food costs by $3 billion.[17](If the cost to the chain restaurant industry alone is in the billions, as indicated by the PwC report, these costs are not being passed-on to consumers). However, chain restaurants cannot absorb these higher food commodity prices in perpetuity.

As we noted earlier, the chain restaurant industry is extremely competitive and profit margins are very thin. The effects of the RFS in terms of higher food commodity costs for chains and their franchisees are significant and long-term. A ten percent increase in the cost of food commodity purchases for a chain restaurant franchisee, when an annual profit margin is only 2-3%, can be devastating. Indeed, a common complaint of restaurateurs who have been forced to close their doors in recent years has been the fact that food commodity prices have risen so high. For those small businesses that survive the higher costs, there are consequences in terms of jobs and opportunities for employees and, ultimately, longer term plans for expansion and growth. Taken cumulatively, the broader economy suffers.

We thank you for the opportunity to comment.

[17] Congressional Research Service, Renewable Fuel Standards (RFS): Overview and Issues, March 13, 2013, p. 17.

National Marine Manufacturers Association

April 1, 2013

The Hon. Fred Upton, Chairman
Committee on Energy and Commerce
United States House of Representatives
Washington, DC 20515

The Hon. Henry Waxman, Ranking Member
Committee on Energy and Commerce
United States House of Representatives
Washington, DC 20515

Dear Chairman Upton and Ranking Member Waxman:

With more than 1500 members representing boat, engine, trailer, and accessory manufacturers, the National Marine Manufacturers Association is the largest trade association representing the recreational marine manufacturing industry. We very much appreciate the opportunity to comment on the issue of ethanol blends in gasoline. Our industry has been at the forefront of testing of such blends, working under the auspices of the United States Department of Energy to test the effects of non-ethanol gasoline, gasoline with 15% ethanol content by volume, and gasoline blends containing butanol. Our comments today are restricted to the effects of e15 blend on marine engines.

As you can readily see from the attached comments, we have determined that e15 blends of ethanol would cause considerable damage to the 7.5 million outboard engines in use in this country today. This damage is unnecessary and can be avoided by freezing the ethanol content of gasoline at 10% by volume. NMMA has never been anti-ethanol. We are simply opposed to fuel blends that will ruin our engines and place lives at risk.

If you would like additional information on the tests we conducted or wish to discuss our submission, please feel free to contact NMMA Legislative Director Jim Currie at 202 737-9760 or at jcurrie@nmma.org.

Sincerely,

Thomas J. Dammrich
President



444 North Capitol Street, NW, Suite 645
Washington, D.C. 20001
202.737.9750 Fax 202.628.4716
nmma.org

# Response to House Energy & Commerce Committee
# White Paper #1 on the Renewable Fuel Standard
# Submitted by the
# National Marine Manufacturers Association
# April 1, 2013

**Question #2: What are the benefits and risks of expanded use of E-15 to automakers, other gasoline powered equipment makers, refiners, fuel retailers, and others involved in the manufacture and sale of gasoline and gasoline-using equipment?**

**Answer:** Outboard engines are perhaps the toughest gasoline engines made, but they are not designed to run on e15 blend gasoline and will be damaged if such an ethanol blend is used in them. No manufacturer of outboard engines warrants their engines to run on an ethanol blend above 10% by volume, and all of them state unequivocally that using an ethanol bend above 10% will void the engine's warranty. The reason for this warning is quite simple: testing has demonstrated that blends at 15% ethanol will absolutely destroy an outboard engine.

Mercury Marine, a division of the Brunswick Corporation located in Fond du Lac, Wisconsin, has been a manufacturer of recreational marine engines since 1939, and it currently makes and sells more marine engines than any other manufacturer in the world. In 2010 and 2011 Mercury Marine tested e15 blend fuel in three different Mercury outboard engines. These tests were conducted at the Mercury Marine test facility in Fond du Lac by Mercury personnel under contract to the US Department of Energy and coordinated by the National Renewable Energy Lab (NREL). The final report was released by the Department of Energy in October 2011 and can be found at the following web site: http://www.nrel.gov/docs/fy12osti/52909.pdf

The objective of these tests was to understand the effects of running a 15% ethanol blend on outboard marine engines during 300 hours of wide open throttle (WOT) endurance testing—a typical marine engine durability test. Three separate engine families were evaluated. A 9.9 HP carbureted four-stroke engine and a 300 HP supercharged electronic fuel injected four-stroke engine represented current products. A 200 HP electronic fuel injected two-stroke engine was chosen to represent the legacy products still in widespread use today. Two engines of each family were evaluated. One engine was endurance tested on e15 fuel, while a second control engine was endurance tested on ethanol-free gasoline.

Ethanol is an oxygenator. E10 fuel has 3% oxygen, while e15 fuel has 5% oxygen. In a typical marine engine this additional oxygen makes the fuel burn hotter, and the higher temperatures can reduce the strength of the metallic components. In addition, because of the chemical interaction, ethanol can cause compatibility issues with the other materials in the fuel systems.

Mercury was able to complete the entire 300 hour test running e15 in the 9.9 HP engine. Test results indicated poor running quality, including the occurrence of engine misfires toward the end of the test.

The poor run quality caused an increase in exhaust emissions. In addition, there were increased carbon deposits in the engine on the underside of the pistons and on the ends of the rods, indicating higher engine temperatures. The photo at the end of this narrative shows the difference in the carbon deposits on the engines run on e0 and e15. Additionally, deterioration of the fuel pump gasket was evident on the e15 engine. This deterioration of the gasket could lead to fuel pump failure, disabling the engine.

The 300 HP four-stroke supercharged Verado engine did not complete the endurance test on e15 fuel. The engine encountered a valve failure after 285 hours of endurance testing. As the photos clearly show, one valve broke apart, which ended the test, and two others developed cracks. These are quality valves constructed of Inconel, a high-temperature alloy. Even so, when Mercury did metallurgical analysis on this engine, it found that the cause of these fractures was deteriorated mechanical strength due to high metal temperature. The next photos show a comparison of the pistons and connecting rods from the Verado engine, also indicating that the e15 test engine operated at elevated temperatures.

The 200 HP two-stroke engine using e15 fuel also failed to complete the endurance test. It failed a rod bearing at 256 hours of testing, resulting in catastrophic destruction of the engine. The photo clearly shows the damage. There was so much damage to the engine that Mercury could not determine the exact cause of failure. Two-stroke engines mix the fuel and the oil and use that mixture to distribute the oil to the critical interfaces such as the bearings and cylinder walls, and ethanol may have an effect on the dispersion or lubricity of the oil mixed with the fuel.

Despite the limited nature of this testing, several significant issues were identified. In addition to the need for more 2-stroke lubrication system testing, more testing is needed to understand how e15 fuel affects marine engines during other operating conditions. Examples would include starting, acceleration/deceleration, and the effect of e15 fuel on marine engines that are stored with fuel in the system over long periods of time, as occurs regularly with marine engines.

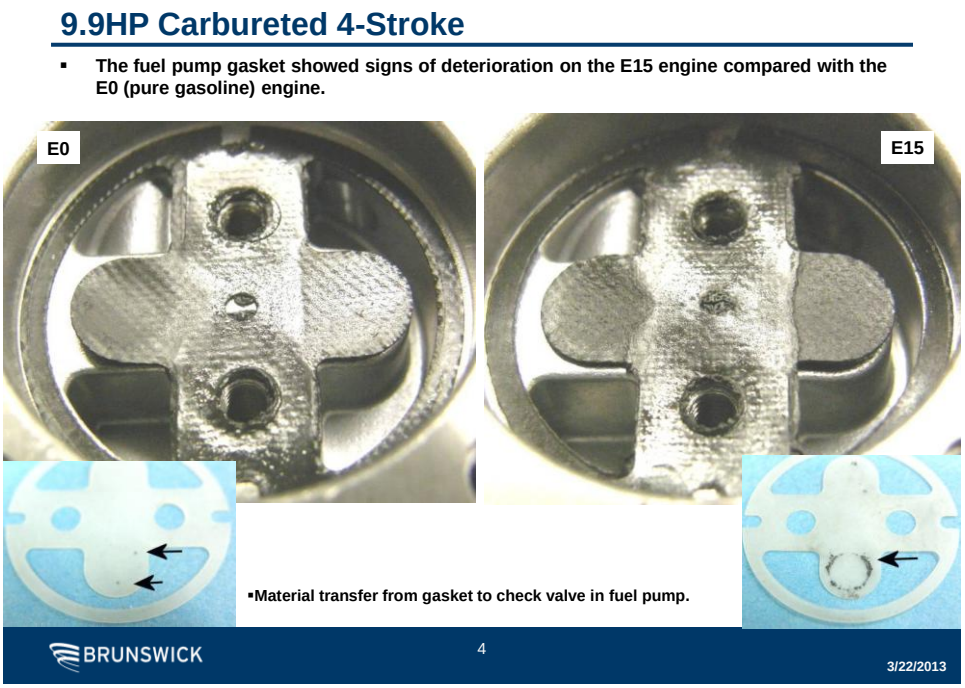
What is presented in this response today—and what is available at the DOE website in full—are the results of the limited testing conducted on three of Mercury's outboard engine families. This study showed how fueling marine engines with e15 may cause a variety of issues for owners and can lead to premature engine failure. There are approximately 7.5 million outboard engines in use today, and every one of them would be threatened with damage or destruction if e15 became the common fuel in the marketplace.

If we extrapolate to other types of engines such as those in motorcycles, snowmobiles, and all-terrain vehicles (ATVs)—which is perfectly fair and reasonable, as the combustion chemistry is the same as for marine outboards—we can see the potential for even more extensive repair and replacement costs to the American consumer, costs that could range into the billions of dollars. If you have a lawnmower or a chain saw or a generator, the principles are the same: high heat comes from the additional oxygen in an e15 blend, and high heat will damage your engine. And if you have an older automobile or truck—anything older than 2001 model year—the EPA says you should not run e15 in it. There are over 120 million older vehicles of this type on American roads today.

Damage to marine engines also carries implications beyond those applicable to automobiles. If an automobile engine breaks down because of ethanol damage, it is a simple matter to pull over to the side of the road and wait for the tow truck. If a boat engine is damaged, the boater might well be miles at sea. The United States Coast Guard was undoubtedly considering this scenario when it told the EPA in a July 2, 2009, letter that the EPA's proposed waiver to allow the sale of e15 "has raised concerns related to possible reduction in the level of safety for recreational boaters . . . ." As a result, said the Coast Guard, it could not support the waiver to allow e15 usage.

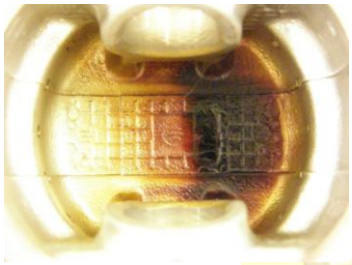
NMMA does not see any benefits in the expanded use of e15. It is certain that if e15 were to become the common fuel in the marketplace, extensive misfueling would occur, with consequent damage to marine and other engines. We do not believe that there would be any benefit to the American consumer as a result of wide-spread availability of e15 blend gasoline. Rather, any American consumer who owns any gasoline-powered equipment, whether boat, snowmobile, motorcycle, ATV, lawnmower, chain saw or weed whacker, would almost certainly incur the expense of repair or replacement of that equipment because of the damage caused by e15 use. In the case of boats, motorcycles, ATVs and snowmobiles, that cost could be in the thousands of dollars per vehicle. These are costs that are totally avoidable by changing the RFS to reflect the knowledge and understanding about ethanol-blended fuels we have gained since 2007.

## Photos from Mercury Marine Outboard Tests

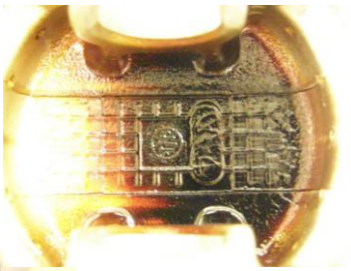


## 9.9HP Carbureted 4-Stroke

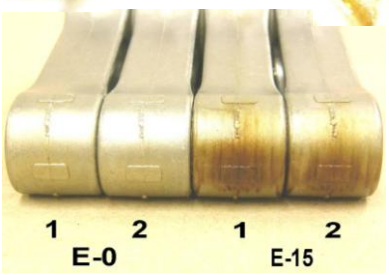
- More carbon deposits on piston underside and rods of E15 engine.



E0

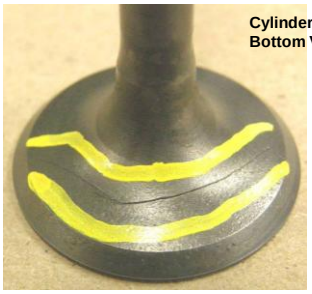


E15






## 300HP Supercharged 4-Stroke


## 300HP Supercharged 4-Stroke

- **Carbon deposits may indicate that the E15 engine's pistons and connecting rods were hotter during operation than those in the E0 engine.**

E0

E15



## 200HP EFI 2.5L 2-Stroke

**Recovered Pieces from Failed Rod Bearing**

**Undamaged Bearing**

**Undamaged Rod** **Damaged Rod**

**Question #3. What are the risks of the introduction and sale of E-15 to the owners of pre-2001 motor vehicles, boats, motorcycles, and other gasoline-powered equipment not approved to use it? How do these risks compare with the benefits of the RFS?**

**Answer:** As mentioned above in answer to Question #2, one of NMMA's member companies tested e15 gasoline blend on new, right-off-the-production-line outboard engines and determined that this blend of ethanol damages engines because of the additional oxygen it provides to the combustion chamber. These findings would be applicable to all marine outboard engines in use today, including those manufactured prior to 2001. There are approximately 7.6 million outboard engines on registered boats today, plus over 1 million personal watercraft whose engines would be affected adversely by higher ethanol blends. The repair and replacement costs if these engines were damaged by e15 blend, would likely reach into the billions of dollars. This is a cost to the American consumer which is easily avoided by changing the RFS so that it does not allow ethanol blends exceeding 10% by volume. There will be outcries from the corn farmers and the ethanol producers, but it seems to NMMA that the United States Government should not enact policies like the Energy Security and Independence Act of 2007 that require the American consumer to purchase a product which will harm the very device that he puts it into. We believe that the RFS, while well-meaning, was enacted before we knew the full effect that increasingly-high blends of ethanol has on gasoline-powered equipment. Now that we know these effects, we believe it is time to change the RFS to reflect the current state of knowledge. Based on our testing, we see no benefits to the ever-increasing amounts of ethanol that the RFS requires be blended into our fuel supply between now and 2022.

April 29, 2013

The Honorable Fred Upton
Chairman
U.S. House of Representatives
Committee on Energy & Commerce
Rayburn House Office Building
Washington, D.C. 20515

The Honorable Henry Waxman
Ranking Member
U.S. House of Representatives
Committee on Energy & Commerce
Rayburn House Office Building
Washington, DC 20515

**Re: Response of the U.S. Pork Industry to Stakeholder Questions Regarding Agricultural Sector Impacts of the Federal Renewable Fuels Standard**

Dear Chairman Upton and Ranking Member Waxman:

The National Pork Producers Council (NPPC) is pleased to respond to the House Energy & Commerce Committee's questions for stakeholder comment regarding the agricultural sector impacts of the Federal Renewable Fuels Standard (RFS). In addition to the comments below, NPPC has signed on to a general set of responses to the committee's questions that were prepared by a coalition of livestock and meat organizations that initially petitioned the U.S. Environmental Protection Agency (EPA) for a waiver of the RFS mandate last July. The coalition responses, which will be submitted under separate cover, are also attached. NPPC's specific answers supplement the views of the coalition and provide additional detail to further inform the committee of the views of the U.S. pork industry and our industry's experience in competing in tight markets for corn where growth in demand far outstripped growth in available supply.

NPPC is an association of 43 state pork producer organizations and the voice in Washington for the nation's 67,000 pork producers. It conducts public-policy outreach, enhancing opportunities for the success of U.S. pork producers and other industry stakeholders by establishing the U.S. pork industry as a consistent and responsible supplier of high-quality pork to the domestic and world markets.

Pork is a vital part of American history, the economy and everyday life. Behind this long-standing agricultural industry are the producers, processors and allied industries that all work together to produce what has become the highest quality, safest and most affordable supply of pork and pork products in the world. The U.S. pork industry represents a significant value-added activity in the agriculture economy and the overall U.S. economy, employing significant numbers of American workers. Economists Dan Otto and John Lawrence at Iowa State University estimate that the U.S. pork industry is directly responsible for the creation of 34,720 full-time equivalent jobs and generates 127,492 jobs in the rest of agriculture. It is also indirectly responsible for 110,665 jobs in the manufacturing sector, mostly in the packing industry, and 65,224 jobs in professional services such as veterinarians, real estate agents and bankers. All told, the U.S. pork industry is responsible for 550,221 mostly rural jobs in the United States.

Today, the U.S. pork industry is the No. 1 exporter of pork worldwide. This position has been achieved through decades of commitment to improvement in the industry's practices,

including quality, food safety, animal care and the environment but primarily comes from the ability of the U.S. pork industry to remain both the most stable source and most competitively priced supplier of pork to growing world markets. In recent years, China, Russia, South Korea and Latin America have accounted for the U.S. pork industry's greatest market growth. With it has come significant economic benefit not just to the United States as a whole but in particular to those rural regions and communities where pork producers live and work.

NPPC has never opposed either the emergence of the domestic ethanol industry nor the RFS. However, it has always been the view of the U.S. pork industry that the RFS failed to provide any flexibility to account for changes in market conditions that can greatly affect our sector and other agricultural sectors. Ethanol supporters have long claimed that the RFS's so-called "waiver provision" would provide that flexibility and guard against adverse economic impacts. However, the complete failure of the waiver provision in 2012 to provide any relief from the disastrous combination of ever-increasing ethanol production mandates and substantial constriction in the production of corn raises serious concerns with the viability of the waiver process. If EPA cannot or will not grant a waiver of the RFS even during the worst drought in 70 years as grain supplies and harvest yields plummeted precipitously, the fundamental underlying flaws of the RFS are clear.

At a minimum, reform of the RFS must ensure a fair and equitable distribution of natural marketplace risks among all end users of corn and other grains. The U.S. economy was built on the notion of fair and free markets. It's simply unacceptable to continue the current federal policy of shielding from natural marketplace conditions a single, long-established, legacy industry over the interest of the rest of the U.S. economy and American consumers.

The U.S. pork industry appreciates the efforts that the committee has undertaken to review the impacts of the RFS in a rational, deliberate and mature fashion. We look forward to continuing to engage with the committee as it moves forward in its review of the RFS program. If any additional information or insight are needed, please do not hesitate to contact Michael Formica, Chief Environmental Counsel, in our D.C. office at (202) 347-3600 or by e-mail at formicam@nppc.org.

Sincerely

Randy Spronk
President
National Pork Producers Council
Edgerton, MN

April 29, 2013

The Honorable Fred Upton
Chairman
House Energy & Commerce Committee
2125 Rayburn House Office Building
Washington, DC 20515

The Honorable Henry Waxman
Ranking Member
House Energy & Commerce Committee
2125 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Upton and Ranking Member Waxman:

The livestock and poultry groups appreciate your leadership with the release of a white paper reviewing the agricultural impacts due to the renewable fuel standard (RFS). Please find below comments submitted on behalf of:

American Meat Institute
American Sheep Industry Association
California Dairies, Inc.
Milk Producers Council
National Cattleman's Beef Association
National Pork Producers Council
National Turkey Federation
North American Meat Association

In addition, please find attached a study entitled "The RFS, Fuel and Food Prices, and the Need for Reform" completed by Dr. Tom Elam of FarmEcon on behalf of the listed organizations. We look forward to working with you and your staff as this issue progresses within the committee.

## Animal Agriculture Impacts due to the RFS

Effects of the RFS versus market forces in bringing about the rapid 2007-2012 increase in U.S. ethanol production, and the corn that it has taken off the market, is central to this discussion. If the RFS has played little or no role, then there is no need to reform the current program. If the RFS is a significant driver, is distorting markets, and the market has played a secondary role, then a debate is in order.

Iowa State's FAPRI econometric model has generated results that suggest that lowering the RFS would have little impact on corn prices of ethanol production. The implication reached was that it is market forces that are the primary driver.

However, there are two facts in evidence that strongly suggest that the role of the RFS has been the primary force in the rapid development U.S. corn-based ethanol.

First is the simple fact that nowhere in the world have we seen any significant biofuel production created without strong government support in the form of mandates and/or subsidies. Everywhere you look, markets have not been the primary drivers. China, Canada and the EU, once strong proponents of biofuels, have backed away from increasing biofuel production by mandates and subsidies. The U.S. RFS program is by far the most ambitious biofuel mandate in the world, and we have seen the most rapid increase in ethanol production on record.

If biofuels were a marketplace phenomenon, driven by business people who see market-based opportunities, we would see biofuel investments without mandates and subsidies. We do not see those free market investments happening on any significant scale. The RFS is the primary driving force behind U.S. ethanol production, and the RFS debate is of vital importance.

The second fact in evidence is the biofuel sector's strong negative reaction to this debate. If the sector had any faith in its ability to maintain and grow its market based on the merits of its products it would not object strenuously to RFS reform. The leadership of the ethanol industry is fully aware that if the support of RFS mandates is reduced or eliminated, their business will suffer. This fact further validates the RFS as the key driver behind ethanol industry growth.

**1. What has been the impact of the RFS on corn prices in recent years? What has been the impact on soybean prices? Have other agricultural commodity prices also been affected?**

The RFS has been the major driver in increasing corn use for ethanol production, and causing corn stocks to decline to crisis levels. In a market-driven world, ethanol would be priced competitively with gasoline. That has never been true in the entire history of the industry. Once relegated to niche additive markets for octane enhancement and oxygenation, ethanol was originally worth a premium to gasoline. At current production levels, ethanol is being used for its energy content, about 67% of gasoline. At current (April 18, 2013) gasoline price levels ethanol has a market value of about $1.80 per gallon for its energy content. The national average wholesale price was about $2.70 today. At $1.80 per gallon, an ethanol plant can afford to pay only $3.80 per bushel for corn. At $2.70 per gallon for ethanol, the affordable corn price for an ethanol producer is $6.55 per bushel. Thus simple, one day, example of how far from true market value the RFS has taken corn prices is typical of what has been driving daily corn prices since 2008.

A secondary effect has been increased corn price volatility. Compared to 2000-2006, corn price volatility has doubled since the RFS became law. The RFS has driven corn use growth faster than production. The result is stocks chronically depleted to minimum levels, causing market prices for corn and other agricultural commodities to swing wildly on the whims of the weather.

Corn is by far the most important food ingredient in U.S. agriculture. Other farm commodity prices are correlated with corn. That list includes wheat, soybean meal, sorghum, barley, oats, and hay. In addition, by-product feed prices such as distillers' grains, wheat milling by-products, edible fats, meat and bone meal and oilseed milling are all influenced by corn prices.

**2. How much has the RFS increased agricultural output? How many jobs has it created? Have any jobs been lost? What is the net impact on the agriculture sector?**

We need to discount 2012 because of the weather disaster that reduced crop production. However, using 2012 data, since the RFS arrived in 2008, total corn, wheat and soybean production have not grown. In fact, corn production declined 10.8%, soybean production increased 1.6%, and wheat production is down 9.2%. If we go back one year, to 2011, and compare to 2008, corn production was up 2.2%, soybeans up 4.2% and wheat was down 20%. While 2012 weather has played a role, since the current RFS was created total major crop production has not materially increased.

The jobs question is difficult to answer, but if we look objectively at jobs created by various corn using industries the answer is that increased ethanol has undoubtedly destroyed more jobs than it created.

Using a recent 2013 Renewable Fuels Association study, there were 11,971 direct jobs in the nation's ethanol companies in 2012. According to a 2009 American Meat Institute study there are 524,500 direct jobs in meat and poultry processing. Both estimates are for direct employment only, and do not include indirect and induced effects.

If we include indirect and induced jobs, the Renewable Fuels Association study claims a total of 383,260 total jobs that are affected by ethanol production. This implies that every ethanol plant job supports, in a meaningful way, another 32.5 jobs in the economy. That "jobs multiplier" of 32.5 is about 10 times what is generally accepted by economists.

The similar 2009 American Meat Institute study claimed a jobs multiplier of 2.4, and total direct, indirect and induced jobs of 1,269,500. The bottom line is that just the meat and poultry portion of food production supports a much larger labor force than the entire fuel ethanol industry.

Scaling jobs to the amount of corn used also shows large differences. A million tons of corn used to produce meat and poultry supports over 3,600 direct jobs. That same volume of corn used by the ethanol sector supports only 145 jobs. Including indirect and induced employment (as claimed by the respective industry associations), a million tons of corn supports 5,117 ethanol-related jobs and 8,119 meat and poultry-related jobs. The ethanol industry claim is based on a jobs multiplier that is significantly higher than generally accepted.

To the extent that the RFS has diverted corn from food to fuel production, jobs have been lost. It is not just current jobs that were lost, but job creation opportunities that were not realized because food production was constrained.

From 2007 to 2012, over 27.9 million tons of combined corn and distillers' grains were removed from total food production, of which meat and poultry processing is only a portion. Ethanol producers' corn use, net of distillers' grain returned to food production, increased about 40.6 million tons over this same period. Given the vastly different direct job multipliers, far more direct jobs, existing and potential, were destroyed in meat and poultry processing than were created by ethanol producers.

**3. Was EPA correct to deny the 2012 waiver request? Are there any lessons that can be drawn from the waiver denial?**

The waiver petition should have been granted. Record-high corn prices, distress in the food sector, corn exports that declined by 50%, the closing of numerous ethanol plants, and skyrocketing D6 ethanol RIN values are all symptoms of severe economic distortions caused by the RFS. Market forces should have been allowed to allocate the limited corn supply.

The lesson learned is that the EPA should not have the sole power to judge waiver requests.

**4. Does the Clean Air Act provide EPA sufficient flexibility to adequately address any effects that the RFS may have on corn price spikes?**

No, it does not. The current mechanism is cumbersome, inflexible and does not fairly weigh the effects on all affected parties. The Clean Air Act should be amended, or the entire conventional fuel RFS should be removed.

**5. What has been the impact, if any, of the RFS on food prices?**

Food prices are covered extensively in the paper submitted with these comments. Since the RFS was implemented in 2008, food price inflation has gone from slightly slower than general inflation to 60% higher than general inflation. Food affordability that had been increasing steadily since 1950 suddenly reversed that trend, and food started to become less affordable. Higher food costs are damaging the economy's ability to create jobs, and holding down consumers' ability to increase discretionary spending. As stated at the beginning, much of the reversal in food affordability is the result of the RFS, and the market distortions it has caused.

# RENEWABLE FUEL STANDARD ASSESSMENT

## WHITE PAPER

## AGRICULTURAL SECTOR IMPACTS

Submitted by:

**National Pork Producers Council**

April 29, 2013

For additional information and insight, please contact:

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**Questions for Stakeholder Comment**

1. *What has been the impact of the RFS on corn prices in recent years? What has been the impact on soybean prices? Have other agricultural commodity prices also been affected?*

Variability in the supply and demand for corn, like that for any other commodity, and its impact on end users, such as pork producers, make corn markets - under the best of circumstances - complex and prone to risks. At any given time, there are a number of factors that contribute to rising and falling prices such as weather, transportation and energy costs, seed and fertilizer prices, and the mandatory conversion of corn into ethanol fuel. Fortunately, for most of the history of corn production in this country, a fundamental characteristic of the sector was its consistent ability to sustain a sufficient production and stocks capacity to buffer against a large portion of the potentially disastrous effects of **normal, short-term** demand and supply shocks. Unfortunately, due to the RFS, this is no longer the case.

The inherent buffering capacity of the corn sector has been significantly strained by the artificial, federally-mandated, year-after-year growth in the demand for ethanol and the corn that produces it. Over the last several years the corn sector has had to substantially increase its output year over year to keep up with the mandated growth in ethanol's demand for corn, putting the system at risk of being largely incapable of adjusting to and mitigating the worst effects of severe supply shocks like that resulting from this last year's drought. Last year, the size of the spikes in corn prices and the price of corn itself reached unprecedented levels. And the increasing RFS mandate could further exacerbate these conditions in coming years.

Fortunately, so far the nation has not had had major supply shocks two-years in a row. But if that were to happen, pork producers and the entire U.S. livestock industry would be in unprecedented, severe and dire circumstances. Indeed, the dramatic problems caused by 2012's drought will be magnified enormously in 2013 and 2014 should there be any kind of supply shock in this year's corn production. And the resulting impact and the disastrous effects it will have on producers who depend on corn will have been greatly exacerbated by EPA's denial of the numerous requests that the Agency received last year for a full or partial waiver of the RFS extending into 2013. Whatever limited flexibility may in exist in the first year of a supply shock disappears altogether in an ensuing year as the RFS creates additional binding constraints.

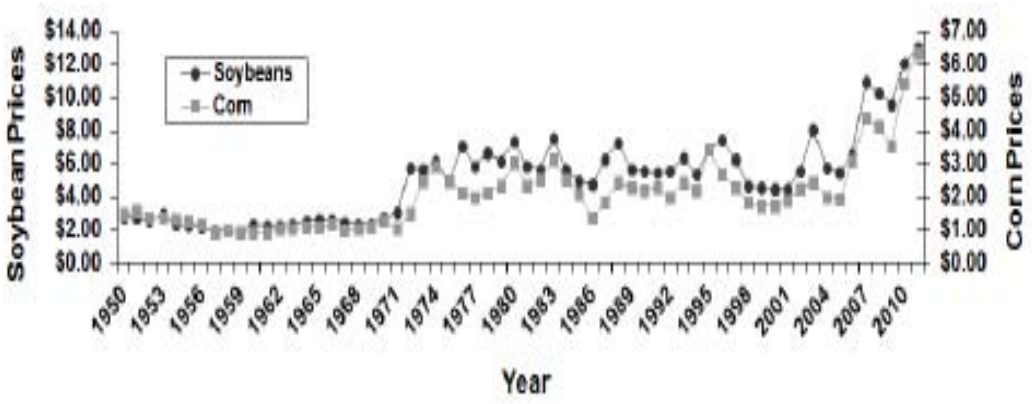
Rather than acting as a safety net that can support and add financial and business certainty to the otherwise financially competitive ethanol sector, the RFS has aggressively restructured the market for corn. The RFS shields the ethanol sector from normal market forces that all other corn users must deal with to ration corn use relative to its supply and price. Under normal circumstances, this creates inequities that have resulted in significant marketplace impacts for all non-ethanol users of corn. Under the historic drought conditions with record crop losses, those consequences become crippling. We discuss all of these matters in more detail below.

For the pork industry, this RFS-driven intensification of the current weather shock has significant impacts. It puts at risk the future availability of sufficient supplies of feed, which not only will stunt the growth of the industry and hurt its competitiveness in world markets, but will

also force otherwise profitable and sound family pork operations to leave the business and prompt concentration in the pork sector to increase. Again, these sad and sobering developments are directly attributable to mandating one use of corn (ethanol) over another (feed and food) without sufficient and easily implemented policy mechanisms to relieve pressures on non-ethanol use of corn when corn supplies are unusually tight. The bottom line is that the RFS has made it impossible for pork or other livestock producers to fairly and freely compete in the same marketplace for finite supplies of corn.

Since Congress first enacted the RFS, the price of corn has grown steadily. As NPPC noted in its comments submitted on the 2008 waiver request from the State of Texas,[1] as the demand for corn-based ethanol began to grow to meet the needs of the RFS, prices per bushel of corn quickly increased from about $2.00 in the summer of 2006 to $3.50 per bushel in September 2007 when regulations for the RFS I were first implemented. Since that time, the prices of corn and soybeans have trended strongly upward in concert with the increasing demands of the RFS.

Average Iowa Corn and Soybean Prices by Marketing Year 1950 - 2011




Source: USDA National Agricultural Statistics Service, Iowa Field Office[2]

This is not to suggest that the entirety of this increase is attributable to the RFS. However, the RFS mandates have required a steady and substantial increase in the use of corn starch ethanol, ultimately resulting in the increased annual consumption of about *six billion more gallons of ethanol from 2008 to 2013*. Year after year, more corn is diverted from the production of feed, food and other uses to the production of ethanol.

The RFS has created a mandatory market for corn-based ethanol imposed under the threat of legal sanction. Both the Energy Policy Act of 2005 (EPAct) and the amendments to EPAct made by the Energy Independence and Security Act of 2007 (EISA) (RFS II) created a

[1] 73 Fed. Reg. 26,026 (August 13, 2008).

[2] Chart copied from: http://www.extension.iastate.edu/agdm/crops/pdf/a2-11.pdf.

permanent and growing renewable fuel mandate. Increases in yearly requirements for renewable fuel were specifically mandated under EPAct through 2012, with a statutory formula for imposing a minimum applicable volume in 2013 and subsequent years.[3] Increases in yearly requirements for renewable fuel are mandated under EISA through 2022, and the level of the renewable fuel requirement in 2023 and beyond is to be determined by the EPA in coordination with the Secretary of Energy and the Secretary of Agriculture.[4]

Thus, the RFS has created entirely new market conditions for corn than existed prior to the enactment of the requirement in 2005. Prior to the RFS, corn prices remained steady from at least 1970 until 2005. After enactment of the RFS, prices escalated. While there are certainly other variables at work, including the changing world markets and the price of oil, it is implausible to suggest that a mandatory market for 40- 45 percent of a commodity, imposed in just six years, has no effect on the price or supply of the commodity let alone a significant impact. In no other setting would any credible economist or analysts claim that steadily increasing the demand for a product by 40 percent or more over six years would do anything other than increase that product's price. Indeed, it would not be surprising for undergraduate microeconomics textbooks of the future to use the RFS as its classic example of shifting the demand curve outward for a product and resulting in price increases.

USDA has recognized this. In 2001, the Secretary of Agriculture predicted that switching from a prior gasoline additive (MTBE) to corn-based ethanol during the 2000-2004 time period in order to meet requirements for oxygenate contained in the Reformulated Gasoline program would add 14 cents to the price of a bushel of corn each year through 2010. This significant effect was determined based on an expected increase in the use of far lower volumes of corn – 500 million bushels per year – than the nearly 5 billion additional bushels of corn that the RFS will require to be used in 2013.[5]

In the years prior to the enactment of the RFS, studies referenced by the ethanol industry also predicted that imposing the requirement would increase the level of corn prices. A 2001

[3] CAA section 211(o)(2)(B)(ii)-(iii) prior to amendment by EISA.

[4] CAA section 211(o)(2)(B)(ii).

[5] The USDA indicated that the MTBE phaseout would increase the demand for corn by 500 million bushels per year beginning in 2004 and stated that "[t]he increase in corn demand would increase the average price of corn by about 14 cents per year during the projection period, 2000-2010. Letter from the Secretary of Agriculture to Senator Tom Harkin. Document posted on website of the Renewable Fuels Association ("RFA") at: http://www.ethanolrfa.org/page/-/rfa-association-site/studies/USDA%20on%20MTBE.pdf?nocdn=1. Another RFA study predicted a somewhat lesser effect of 5 to 10 cents per bushel. *See* http://www.ethanolrfa.org/page/-/rfa-association-site/studies/localcommunity.pdf?nocdn=1. These documents are also included as attachments to these comments.

analysis of legislation imposing a renewable fuels requirement of 3.3 percent predicted that average corn prices for farmers would increase 11.1 percent above baseline levels.[6]

As shown in the following table, the year over year, for the past five years, EPA has mandated a renewable fuel applicable volume satisfied by the use of corn starch that has increased significantly each year.

| | Total Renewable Fuel (in billion gallons "bgal") | Corn Starch Ethanol[7] (in billion gallons "bgal") |
|---|---|---|
| 2008 | 9.0 bgal | 9.00 bgal |
| 2009 | 11.10 bgal | 10.50 bgal |
| 2010 | 12.95 bgal | 12.00 bgal |
| 2011 | 13.95 bgal | 12.60 bgal |
| 2012 | 15.20 bgal | 13.20 bgal |
| 2013 | 16.55 bgal | 13.80 bgal |

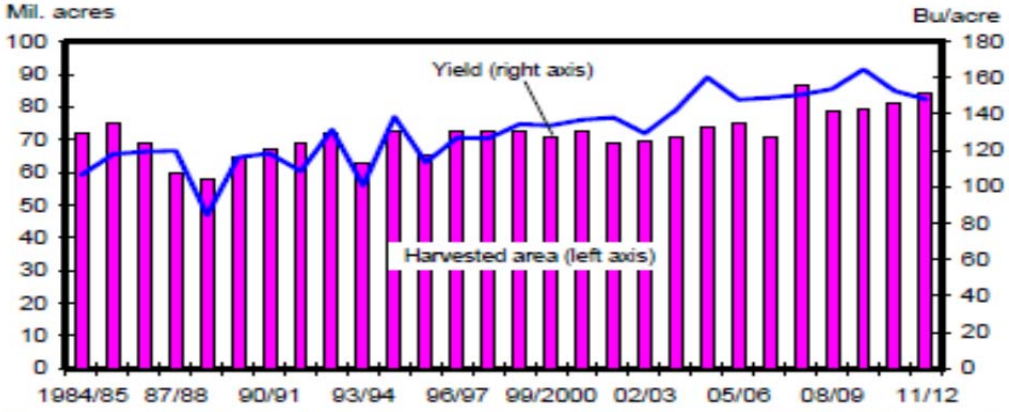
Corn prices have trended strongly upward over this period, leading to more acres of corn planted and harvested. That, coupled with corn yields trending upward has allowed corn supply to almost keep up with total demand for corn production, which has varied between approximately 12 billion and 13 billion bushels over the last five years.[8] As detailed below, demand growth has exceeded the supply of corn (dramatically so in 2013) leading to progressively lower ending stocks.

[6] *An Economic Analysis of Legislation for Renewable Fuels Requirement for Highway Motor Fuels*, John M. Urbanchuk, AUS Consultant, November 7, 2001. This analysis referenced then-pending legislation, S. 670, S. 892, S. 1006, and H.R. 2423 which contained a percentage standard for renewable fuels. Document accessed through RFA website at http://www.ethanolrfa.org/page/-/rfa-association-site/studies/rfsforhwymotorfuels.pdf?nocdn=1. These documents are also included as attachments to these comments. This document is also included as attachments to these comments.

[7] *Renewable Fuel Standard (RFS): Overview and Issues*, Congressional Research Service, March 14, 2013. Available on the internet at: http://www.fas.org/sgp/crs/misc/

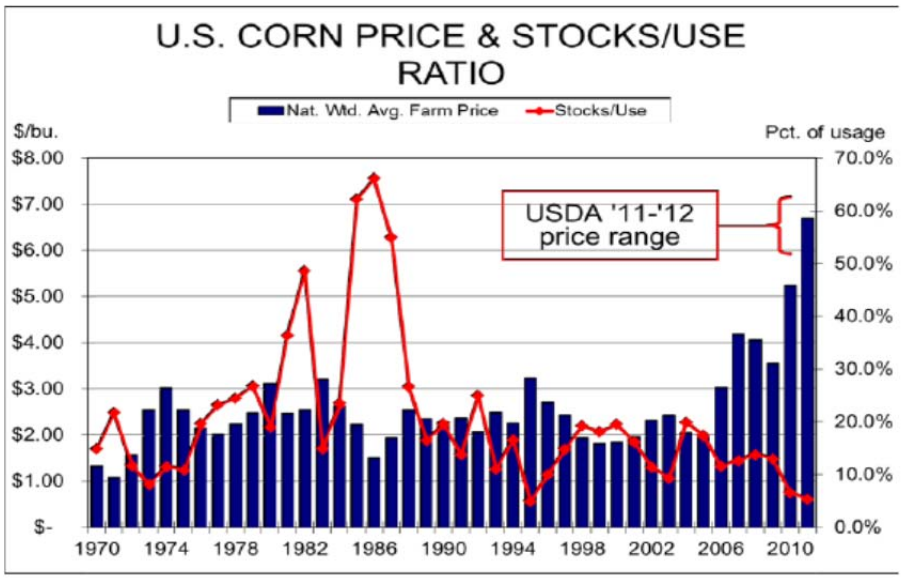
[8] Chart on this page appeared in Crop Production Report, Department of Agriculture, National Agricultural Statistics Board, October 12, 2011.

Figure 2
**U.S. corn harvested area and yield**




Sources: USDA, National Agricultural Statistics Service, *Quick Stats* and USDA, World Agricultural Outlook Board, *WASDE*.

Corn prices over this period have increased considerably, nearly tripling from 2005 to the present and are currently reaching record highs in response to the drought. At the same time, corn ending stocks have tightened considerably, making the market more volatile and susceptible to things such as drought-induced supply shocks.



2. *How much has the RFS increased agricultural output? How many jobs has it created? Have any jobs been lost? What is the net impact on the agriculture sector?*

We cannot speak to the net effects of the RFS on agricultural output and jobs. We can give you a sense of what the RFS has meant to the U.S. pork industry, and how economic activity and job creation in the pork industry compares to that of the ethanol industry. We discuss these matters below.

The U.S. pork industry is a vital part of the domestic agricultural economy and a significant portion of the overall American economy. Undergirding this long-standing agricultural industry are the producers, processors and allied industries that all work together to produce what has become the highest quality, safest and most affordable supply of pork and pork products in the world. The U.S. pork industry represents a significant value-added activity in the agriculture economy and the overall U.S. economy employing significant numbers of American workers. Economists Dan Otto and John Lawrence at Iowa State University estimate that the U.S. pork industry is directly responsible for the creation of 34,720 full-time equivalent jobs and generates 127,492 jobs in the rest of agriculture. It is indirectly responsible for 110,665 jobs in the manufacturing sector, mostly in the packing industry, and 65,224 jobs in professional services such as veterinarians, real estate agents and bankers. All told, the U.S. pork industry is responsible for 550,221 mostly rural jobs in the U.S.

Since the RFS's implementation, and especially since RFSII's introduction in 2008, the U.S. pork industry has struggled through a number of crises including a major economic crisis immediately after RFSII that appears to have been caused, in significant part, by the RFS. However, it is very difficult to identify, at a national level, the precise cause for the loss of any individual farm or groups of farms. Furthermore, at the same time that these crises have hit, the industry was fortunate to be blessed with the emergence of robust trade markets that allowed the overall industry to minimize overall farm and job losses.

Nevertheless, as the balance sheet below makes clear, since implementation of the RFS II in 2008, the amount of corn fed to livestock has decreased every year (sometimes dramatically) from 5.913 billion bushels in 2007-2008 crop year to a projected 4.400 billion bushels this crop year. At the same time, the share of corn consumed by ethanol industry following the increase of the RFS has grown explosively year after year, from 3.049 billion bushels in the 2007-2008 crop year to a projected 4.575 billion bushes this crop year.

| R. Wisner | | | | | Updated 4/11/2013 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Table 1. Corn Balance Sheet | Historic | | | | | Prelim. | Proj. | Porj. 2013-14 | | | WASDE |
| | 2006-07 | 2007-08 | 2008-09 | 2009-10 | 2010-2011 | 2011-2012 | 2012-13 | Low | Med.1/ | High | 4/10/2012 |
| Yield (bu. per acre) | 149.1 | 150.7 | 153.9 | 164.7 | 152.8 | 147.2 | 123.4 | 125.0 | 155.0 | 162.0 | 122.3 |
| Long-term Historical Yield Probability: | | | | | | | 15% | 18% | 64% | 18% | |
| Supplies: | | | | | | | | | | | |
| Planted acres (million) | 78.3 | 93.5 | 86.0 | 86.4 | 88.2 | 91.9 | 97.2 | 96.5 | 96.5 | 96.5 | 97.2 |
| Harvested acres (million) | 70.6 | 86.5 | 78.6 | 79.5 | 81.4 | 84.0 | 87.4 | 87.0 | 89.6 | 89.6 | 87.4 |
| Production (mil. bu.) | 10,535 | 13,038 | 12,092 | 13,092 | 12,447 | 12,360 | 10,780 | 10,875 | 13,888 | 14,515 | 10,780 |
| Beginning carryover (mil. bu.) | 1,967 | 1,304 | 1,624 | 1,673 | 1,708 | 1,128 | 989 | 692 | 692 | 692 | 989 |
| Impots | 12 | 19.7 | 13 | 9 | 28 | 29 | 115 | 100 | 17 | 13 | 125 |
| Total Supply (incl. imports) | 12,514 | 14,362 | 13,729 | 14,774 | 14,182 | 13,517 | 11,884 | 11,647 | 14,597 | 15,220 | 11,894 |
| Total Usage: (mil. bu.) | | | | | | | | | | | |
| Feed & residual | 5,598 | 5,913 | 5,182 | 5,140 | 4,795 | 4,548 | 4,400 | 4,025 | 4,650 | 4,850 | 4400 |
| Ethanol | 2,117 | 3,049 | 3,709 | 4,568 | 5,011 | 5,011 | 4,575 | 4,750 | 5,100 | 5,200 | 4550 |
| Food, ind. & seed | 1,371 | 1,338 | 1,316 | 1,371 | 1,415 | 1,426 | 1,387 | 1,350 | 1,410 | 1,420 | 1387 |
| Exports | 2,125 | 2,437 | 1,849 | 1,987 | 1,834 | 1,543 | 830 | 875 | 1,500 | 1,575 | 800 |
| Total Usage | 11,210 | 12,737 | 12,056 | 13,066 | 13,055 | 12,528 | 11,292 | 11,025 | 12,810 | 13,045 | 11,262 |
| Ending Carryover: (mil. bu.) | 1,304 | 1,624 | 1,673 | 1,708 | 1,128 | 989 | 692 | 647 | 1,937 | 2,175 | 757 |
| Carryover, weeks of total use | 6.0 | 6.6 | 7.2 | 6.8 | 4.5 | 4.1 | 2.5 | 2.8 | 7.3 | 8.7 | 2.8 |
| Prices: | | | | | | | | | | | |
| U.S. weighted avg. farm price | $3.04 | $4.20 | $4.06 | $3.55 | $5.18 | $6.22 | $6.95 | $7.30 | $5.00 | $4.85 | $6.75-7.15 |
| Iowa weighted avg. farm price | $2.99 | $4.15 | $4.01 | $3.50 | $5.13 | $6.12 | $6.85 | $7.20 | $4.90 | $4.80 | |
| Harvest price (central Iowa) | $2.80 | $3.30 | $3.50 | $3.60 | $4.75 | $5.85 | $7.40 | $7.90 | $4.50 | $4.40 | |
| Dec. futures price (harvest avg.) | $3.15 | $3.80 | $3.85 | $3.95 | $5.35 | $6.30 | $7.75 | $8.25 | $4.95 | $4.85 | |
| Wheat/Corn Price Ratio | 1.40 | 1.54 | 1.67 | 1.37 | 1.10 | 1.16 | 1.12 | 1.22 | 1.58 | 1.59 | 1.07 |
| Soybean/corn price ratio | 2.28 | 3.05 | 2.83 | 2.64 | 2.36 | 2.09 | 2.06 | 2.04 | 2.35 | 2.35 | 1.93 |
| SBM/corn price ratio ($/lb.). | 1.88 | 2.24 | 2.28 | 2.46 | 1.87 | 1.77 | 1.73 | 1.48 | 1.82 | 1.62 | 1.72 |
| Wheat Price | $4.26 | $6.48 | $6.78 | $4.87 | $5.70 | $7.24 | $7.80 | $8.90 | $7.90 | $7.70 | $7.90 |

1

What is clear, as both the numbers above and the Iowa State University chart below signal, livestock production in general and pork production in particular generate far more jobs than the ethanol industry. However, it would not be unreasonable for some to assume that along with the reduction in feed use of nearly 1.5 billion gallons of corn has also come the loss of rural livestock production jobs, though firm numbers in that regard are more difficult to come by. Nevertheless, seen even in the best light for the ethanol industry, it is clear that the implementation of federal policies that so overwhelmingly benefit the ethanol over livestock production has created a situation where this opportunity for significantly greater job growth has gone unheeded. As America continues to struggle through its slow, relatively job-less recovery from the Great Recession, with record high unemployment across the U.S., the nation risks losing this opportunity to put large numbers of Americans back to work and improve trade deficits.

*3. Was EPA correct to deny the 2012 waiver request? Are there any lessons that can be drawn from the waiver denial?*

***I. Was EPA correct to deny the 2012 waiver request?***

No. EPA was wrong to deny the 2012 waiver requests from many Members of Congress, 11 state governors and from the U.S. livestock, poultry, and meat industries. Elected representatives in particular often cited the severe economic harm their states and regions due to the RFS mandate. During the worst drought in 70 years, at the point where federally mandated ethanol consumption of corn surpassed feed and food use, EPA should have exercised its clear authority under the RFS to provide temporary relief from the federal mandate and allow other users of corn an adequate and equitable opportunity to compete for those supplies in the marketplace.

We have a number of specific and major concerns with how EPA arrived at its decision. First, EPA's analysis of its waiver authority severely constrained its ability to waive the RFS. In analyzing Clean Air Act section 211(o)(7), EPA constructed a legal wall which it then declared it could not surmount. The Agency stated that it "would not be sufficient for EPA to determine that there is severe harm to the economy of a State, a region or the United States, rather, EPA must determine that RFS implementation would severely harm the economy." By generalizing the harm required to the economy at large, EPA effectively rendered the waiver mechanism meaningless. Although it did not provide a metric for its analysis, EPA seems to imply that the RFS would need to cause an economic recession in the United States before the Agency could legally act to avoid the damage. Such could not have been intended by Congress when it placed the waiver mechanism into the law in 2005.

Second, the agency constructed improperly narrow time frames for reviewing the RFS impacts at the same time it used an expansive interpretation of the waiver test to diminish the appearance of any possibility of relief from a waiver. Despite the fact that RFS mandates have been implemented over several years and have fundamentally changed the markets for corn and feed, in reviewing the waiver, EPA focused solely on effects in 2012/2013. Therefore, even though the impact of RFS requirements have accelerated over time, with annually increasing mandates compounding the harm, EPA considered such information to be irrelevant. In effect, the Agency ignored the elephant in the room: the accelerating diversion of corn to ethanol production versus other uses.

Third, the agency dismissed credible economic information on the impact of the RFS on corn and feed prices while conducting its own non-public analysis of harm based on revisions to an existing model maintained by Iowa State University. This type of decision making can be criticized as arbitrary and capricious. The agency explicitly relied on Renewable Identification Numbers (RIN) market data that lacked any form of transparency or public availability. Against increasingly hard data of crop losses and severely reduced corn yields in 2012, EPA projected what obligated parties might do with RINs that were projected to be "excess" in 2012. Yet this back of the envelope analysis included no attempt to quantify what each obligated party would do regarding the use of different calendar year RINs under different economic assumptions, it simply made a singular, generic assumption based solely on the number of RINs that had been generated in its EPA Moderated Transaction System (EMTS).

To further address the concerns outlined above, we would like to emphasize the following specific points:

- **EPA Improperly Limited The Scope Of Time To Review Impacts of the RFS**: CAA section 211(o)(7)(A) provides that EPA may waive RFS requirements based on a determination that "implementation of the requirement would severely harm the economy or environment of a State, a region, or the United States." In its notice of waiver denial, EPA indicated that it was reviewing only whether implementation of the RFS within the 2012/2013 corn marketing year resulted in severe harm. It specifically classified as "not relevant" concerns that implementation of the RFS since 2006, combined with current conditions, resulted in severe harm. Yet, the plain reading of the statute references the RFS implementation *requirement* in CAA section 211(o)(2), not simply implementation of the renewable fuel volume in any one year. NPPC argued that effects of the RFS in 2012 and 2013 must be considered in the context of a several years of mandatory renewable fuel blending. Therefore, EPA's attempt to narrow its analysis to just effects in 2012/2013 doesn't address the issue of the effect of the RFS in creating a demand "floor" for corn, altering long-term market expectations.

  Furthermore, this position is in direct conflict with the manner in which EPA relied on RIN markets developed over multiple years, and in its calculation of potential price relief due to the continuing multiyear requirements of the RFS. Even though the amount of RIN "carryover" is limited in any one year, EPA's assumption is that extra RINs generated in a previous year will displace the use of current year RINs for compliance. Thus, the total amount of RINs available in 2012 was effectively built up over time through roll-over of RINs from one year to the next. That is, it was not a singular RIN generation event in 2012 that allowed obligated parties – to the extent that they voluntarily engaged in this economic behavior – to have an EPA estimated 2 to 3 billion RINs available in 2013 – but rather the implementation of RFS program requirements as a whole in 2012 and in years prior to 2012. Thus, on one hand EPA drew a narrow focus around its harm analysis, while casting a wide net when looking to flexibility mechanisms that might, theoretically, alleviate the harm.

  In addition, while EPA indicates that the impact of the RFS volume requirements are "highly dependent" on number of RINs that are carried over from year-to-year, the EPA: (1) provided no precise information on currently unused 2011 RINs despite the technical ability to do so; and (2) could not, in fact, precisely determine how many RINs would be carried over from 2012 to 2013 since compliance would not occur until February 2013. The actual response of RIN markets to these conditions in the first quarter of 2013 shows how wrong EPA was in its calculations.

  Since the CAA section 211(o)(2) requirement encompasses multiple years and escalates volume requirements over time, EPA should have considered how *all* such requirements would impact the economy of a State, a region or the United States.

- **EPA Improperly Expanded The Geographic Scope Of Harm In Its Review:** Under CAA section 211(o)(7) EPA is also to determine whether implementation of the RFS requirement would "severely harm" the economy or the environment of a State or region. EPA, however, considered several extraneous issues in its waiver determination including the effect of the RFS on national gasoline prices, the effect of the RFS on several states' gross domestic product and the effect of the RFS on household income. (As mentioned above, EPA also declared that harm must be to the general "economy" versus the more restricted terms of the statute that harm be to a state, a region, or the nation). Thus, on one hand, while EPA narrowly construed "severe harm" to mean only harm occurring in one year, on the other hand, EPA considered broad economic effects apart from those outlined in various petitions and waiver requests when deciding whether such harm existed.[9] Such a review is inconsistent with the statutory directive of CAA section 211(o)(7) to examine harm to "a State' or "a region" and provides an improper test as to whether sufficient harm has occurred that would justify a waiver of the national RFS volume.

- **EPA Improperly Declined To Assert The Authority Congress Provided It To Act**: EPA's waiver relied heavily on CAA section (o)(7) language indicating that the Agency "may" waive the RFS. Implausibly, the agency went so far as to state that the statute "provides EPA with discretion to decline to issue a waiver even if it finds that the severe harm test is satisfied." (Elsewhere, EPA incongruously denied that it interpreted the statute in a manner that would deny the availability of relief). EPA's discretion under CAA section 211(o)(7) must be exercised consistent with the statutory purposes of a waiver, *e.g*., to avoid imposing severe harm while requiring the use of large volumes of renewable fuel in the United States. Congress intended that the waiver mechanism act as a safety valve to prevent ill effects from flowing from the RFS mandates, yet EPA's interpretation of the mechanism is fundamentally at odds with this purpose.

- **EPA's Economic Analysis Was Arbitrary and Capricious:** EPA's decision to deny the waiver requests relied on an Iowa State University (ISU) probabilistic model which is derived from random draws of various corn and gasoline prices along with other variables. EPA briefly discussed additional studies showing possible effects of a waiver of $1.14 or $1.91 per bushel (versus the "no effect" or minimal $0.07 average effect). EPA's decision notes various perceived limitations in the methodology used other studies and expresses the view that it is "critical" to use a stochastic framework, like the ISU model, to evaluate a range of possible outcomes.

[9] EPA did not specifically address whether it possessed authority to balance harms against possible benefits from implementing the RFS. However, EPA clearly sought to diminish the magnitude of any injury by placing harms experienced by various producer groups in the context of the total revenue of the livestock industry and broader measures of the nation's economy.

However, EPA's heavy reliance on one statistical model is flawed itself and improperly ignores other important technical analysis. In addition, the ISU model itself could be challenged as being prone to bias since the ISU model gives greater probability to certain corn yields over other possible yields. It inherently makes some outcomes more likely than others in every possible crop year (no matter what actual conditions are experienced in that year). As a result, EPA's exclusive reliance on the model is inherently arbitrary, constructed to yield a biased result from the outset, especially in a year like 2012 where corn yields fell outside of expected "norms".

In addition EPA also apparently altered the ISU model to further reduce the possibility that ethanol volume requirements would be "binding" and thereby serve to drive the demand for corn. EPA apparently based these alternations on information that refineries could not or would not quickly change fuel formulations if a waiver were granted.

- **EPA's Process Lacked Transparency and Overly Relied on Non-Public Information:** EPA's waiver decision references a "RIN Rollover" memorandum, a Department of Energy memorandum on ethanol demand and a memorandum on the ISU model. None of these documents appeared in the docket prior to the decision being reached, or were otherwise available for review by either the petitioners themselves or the general public. Yet, each of these items formed part of the basis for EPA's decision that the requirements of CAA section 211(o)(7) had not been met. In addition, as cited above, EPA apparently conducted its own analysis of the waiver requests after modifying the ISU model.[10] EPA modified the demand curve for ethanol based on the Agency's "understanding of flexibility in refinery markets over the next twelve months." This altered analysis apparently constrained the free market's ability to use less ethanol in gasoline and thus, presumably, raised the level of ethanol use that is *not* driven by the RFS.

  Since CAA section 211(o)(7) provides that EPA's determination is to occur after public notice and the opportunity for comment, EPA should have provided the public a full opportunity to review and comment on the materials it relied upon in reaching its decision.

## *II. Are there any lessons that can be drawn from the waiver denial?*

There are a number of reforms that Congress could make to the RFS to fundamentally improve the process for waiving the RFS mandate, preventing unintended harm to the U.S. economy, and equitably apportioning risk amongst all end users of corn.

- Congress should make very clear to EPA its intent that the RFS waiver mechanism serve as a circuit breaker, to protect against harm in individual states and local regions of the

[10] 77 Fed. Reg. 70,752, 70,756 (November 27, 2012).

economy as against a federal law that is implemented in a step-wise fashion to increase the renewable fuel content of transportation fuel. As currently implemented by EPA, the waiver appears to be immune from actual crop conditions and market demands. If the waiver is unavailable during economic and natural disasters, then it cannot serve the purpose Congress originally intended for it.

- Access to the waiver provision needs to be expanded and broadened so that all parties impacted by the mandate are provided adequate due process and opportunity to raise concerns as they emerge. We recognize that EPA seeks to guard against frivolous or unsupported waiver requests, but those with a direct interest in the implementation of the RFS should be able to directly petition the EPA.
- The waiver mechanism needs to more clearly define the type and extent of harm the warrants its application. EPA has sought to interpret the provision in a manner that would deny relief except in cases of a national economic calamity. Clearly the intent of Congress in creating the RFS waiver mechanism was focused on averting ill effects from the inability to precisely forecast how much ethanol and other biofuels could be absorbed into transportation fuels over 15 years.
- If the waiver process is designed to respond to state or economic impacts, then EPA's ability to aggregate economic impacts nationwide must be restricted. The analysis needs to look at and balance comparable facts and figures.
- Congress did not provide EPA a broad balancing mechanism in CAA section 211(o)(7) to assess possible harms and "benefits", yet the agency implies that it has the authority to engage in such analysis. This needs to be clarified.
- The waiver mechanism needs to allow its use on a prospective basis, to avoid economic disaster, rather than merely limiting its application after a disaster has struck.
- EPA has so far been incapable of effectively managing RIN markets, providing any form of transparency, or creating any reliance in the long term credibility of RINs. RIN production needs to be better reported to afford long term reliance on the information which is placed in the public domain.

  Fundamentally, EPA is simply the wrong entity to oversee regulation of RIN markets. It lacks the appropriate skills, staff, and focus to manage or understand complex trading markets. At a minimum, the Agency's entire program for managing RINs needs to be rethought and substantially revised.
- Individual caps within the RFS need to be more fluid and flexible within the overall cap. EPA has the ability to provide some level of relief to tight grain markets by significantly increasing the use of advanced biofuels and cellulosic (to the extent they exist) to offset the corn mandate. However, EPA has previously expressed that the agency lacked the ability to expand the mandate for advanced biofuel upward (while still staying under the overall mandated cap for 2013) even on a temporary basis in order to provide relief from the use of corn starch ethanol. This is counterintuitive, and if the fuel exists in the marketplace, seemingly at odds with the express purpose of the RFS to increase the use of advanced and cellulosic biofuels.

4. *Does the Clean Air Act provide EPA sufficient flexibility to adequately address any effects that the RFS may have on corn price spikes?*

No. We presented above several suggestions for how the flexibility provisions must be amended to make them more effective. But we note that the core problems that pork producers face with the RFS is not the flexibility mechanisms but rather the inherent, market-thwarting, automatic bias of the RFS itself in favor ethanol. As referenced in our answers to question 1, recent short corn crops and the resulting tight supplies have invariably meant that pork and other livestock producers were forced to reduce their use of corn because the ethanol industry was guaranteed a market for their RFS-level of production. What this means, in effect, is that some pork producers simply can't afford to feed their animals and have lost their operations when corn prices rose. In practice, the overwhelming bias towards ethanol means whatever flexibility EPA has will be too little, too late. Alternative approaches are needed to meet the nation's legitimate ethanol and biofuels' objectives without building in this tendency to automatically injure the U.S. livestock sector.

5. *What has been the impact, if any, of the RFS on food prices?*

As stated in response to questions1, it is clear that the RFS has had a significant impact on the price and availability of feed for livestock, and has significantly increased the financial risk for livestock producers.

6. *What role could cellulosic biofuels play in mitigating the potential effects of the RFS on corn prices?*

Cellulosic biofuels, depending on the type of cellulosic feedstock involved, could have as bad an effect on corn supplies and prices as corn ethanol, and possibly an even greater detrimental effect. Should the cellulosic feedstock be produced from plant biomass grown as a crop for this specific purpose, demand for the crop acres needed to produce this biomass would inevitably compete for corn acres, raising the price of corn essentially just as much as it would increase were the amount of corn demanded itself were to increase.

The supply of arable land that can be sustainably cultivated in the U.S. is limited. Moreover, the RFS itself places restrictions on land that can be used for the production of renewable fuel. Acres pulled into cellulosic biofuel production because of an artificially inflated demand for that biomass at prices equivalent to that for gasoline must come from that limited pool of available acres. If the acres are pulled from existing pasture or hayage land, the price of pasture and hay will rise and corn acres will be pulled into pasture or hay. If the biomass is produced on former wheat acres, the price of wheat will rise and pull corn acres into wheat. The same is true for any land currently in row crop production.

For example, switchgrass is used today to a limited extent to produce today's modest amounts of cellulosic biofuels. It takes about a ton of switchgrass to produce approximately 100 gallons of ethanol, and yields of switchgrass are about three tons per acre. This means that at 300 tons of ethanol per swtichgrass acre, about 3.3 million acres of cropland are needed to produce a billion gallons of ethanol. That same 3.3 million acres, were it in corn production, would represent

about 550 million bushels of corn, which is almost 72% of the U.S. corn ending stocks projected by USDA for the current corn marketing year. Without question, cellulosic biofuels derived from land that would otherwise be in corn, or crops that compete with corn for acres, will curtail U.S. corn supplies and create much higher corn prices than would result otherwise. That is the straightforward and unavoidable consequence of mandating the blending of cellulosic ethanol made from plant feedstocks that are not themselves waste products.

Exacerbating the problems created by this competition for corn land is the fact that the conversion of cellulosic biomass into ethanol does not produce any animal feed byproducts. In the case of corn ethanol, the DDGs that result from ethanol production are nutritious and can be profitably fed to livestock (in amounts varying according to the species and the nature of their digestive systems.) That is not the case in cellulosic crops like Switchgrass. Not only then would the cellulosic crop compete for corn acres, there would be no mitigating benefit of a feed-suitable by-product. In this sense, the effect of a cellulosic biofuels mandate could be even worse than that for corn ethanol.

As such, National Pork Producers Council cannot support an aggressive cellulosic biofuels mandate premised on the use of dedicated cellulosic crops to generate the feedstock.

This problem with cellulosic biofuels is avoided if the feedstock source of biomass for the cellulosic ethanol is waste products already generated from current crop production or other land use activities. Corn stover is an excellent example of a feedstock that can be used to produce cellulosic biofuels without affecting the supply of corn or the acres being planted to corn. NPPC can therefore support cellulosic biofuels policies that rely on cellulosic waste products as the feedstock.

7. *What impact are cellulosic biofuels expected to have on rural economies as the production of such fuels ramps up?*

See our answer to question 6 above.

8. *Will the cellulosic biofuels provisions succeed in diversifying the RFS?*

See answers #3, #6, and #7.

9. *What is the scale of the impact of the RFS on international agricultural production and global land use changes?*

No response.

[EPA has used economic modeling and other information to estimate the impact of the RFS on global agricultural production and land use. NPPC is not in a position to critique these models or predictions. Instead, NPPC remains focused on the effect of the RFS on domestic pork producers.]

April 29, 2013

The Honorable Fred Upton
The Honorable Henry Waxman
U.S. House Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington, DC 20515

RE: White Paper on Renewable Fuel Standard and Agricultural Sector Impacts
Email: RFS@mail.house.gov

Dear Chairman Upton and Ranking Member Waxman:

The National Restaurant Association thanks you for the opportunity to submit comments regarding the impacts of the Renewable Fuel Standard (RFS). We commend the House Energy and Commerce Committee for taking this first step and urge Congress to carefully examine the RFS and its impact on the agricultural sector, food costs, and consumers.

Founded in 1919, the National Restaurant Association is the leading business association for the restaurant industry, which comprises 980,000 restaurant and foodservice outlets. The restaurant and foodservice industry is the United States' second largest private-sector employer and employs more than 13 million people or 10 percent of the U. S. workforce. In addition, the industry generates $1.8 billion in sales on a typical day.

Clearly, the restaurant industry is a tremendous contributor to our economy and when the industry, as a whole, experiences economic harm, so does our nation's economy.

The restaurant industry strongly supports efforts to reform the RFS, and specifically the standard's corn-based ethanol mandate, which research indicates, has contributed to a significant increase in wholesale food costs. Approximately 40 percent of the domestic corn crop is now being devoted to fuel production rather than food.[1] Diversion of the crop at this level is harmful to the industry by driving up food costs across the board for many food groups.

Restaurants already operate on extremely thin profit margins, and must deal in real time with price spikes to labor, benefits, fuel and food costs. While a well-intentioned effort to diversify the fuel supply and develop additional domestic non-petroleum fuel resources, we fear that at levels such as these, the ethanol mandate and RFS targets for corn-based ethanol are having more harm on the economy than good.

[1] Congressional Research Service, Renewable Fuel Standard (RFS): Overview and Issues, March 13, 2013, pp.19-23.

However, while we oppose the corn-based ethanol mandate, we recognize the importance of our nation's effort to lessen our dependence on foreign oil and increase the use and availability of efficient renewable fuels such as biodiesel and cellulosic ethanol. As a strong supporter of local and national sustainability efforts, and as we are oriented toward eliminating food waste throughout the food processing chain, there continues to be valuable work to be done in these areas.

In fact, the U.S. biodiesel industry has created a market for and increased the value of restaurants' used cooking oil. This market has turned a former waste product into a valuable commodity. In 2012, approximately 900 million pounds of used cooking oil were purchased by the biodiesel industry. This translated into more than $300 million to U.S. restaurants. We feel this is just the beginning of the recovery that is possible with this resource and there are public policy reasons to continue to encourage waste to energy projects.

In addition, advanced biofuels like cellulosic ethanol hold immense promise for our nation's energy security, our rural communities, and our environmental impact. Unlike the corn ethanol industry though, the cellulosic ethanol industry is still immature and faces both economic and technical challenges.

However, while we support these advanced biofuels, we also want to safeguard against price distortions in the food supply and believe that all of the RFS levels should be examined in light of developments over the past decade to determine what adjustments need to be made.

To further explain the effect of the RFS on the restaurant industry, the National Restaurant Association submits the following comments to questions 3 and 5.

**3. Was EPA correct to deny the 2012 waiver request? Are there any lessons that can be drawn from the waiver denial?**

No, the EPA was incorrect to deny the 2012 waiver request. In response to the serious drought of 2012, which devastated corn production in the U.S., the governors of Arkansas, Delaware, Georgia, Maryland, New Mexico, North Carolina, Texas, Utah, Virginia, and Wyoming petitioned the EPA to waive the corn-based ethanol mandate of the RFS citing extreme harm to their states' economies.

Unfortunately, the EPA denied the waiver, arguing that "it is very likely that the RFS volume requirements will have no impact on…….corn, food, or fuel prices."[2]

[2] EPA, Notice of Decision Regarding Requests for a Waiver of the Renewable Fuel Standard, 77 Fed. Reg. 70752, November 27, 2012.

The EPA contended that the standard provides narrow waiver authority and that the Administrator must determine that "the implementation of the mandate itself would severely harm the economy."[3]

The National Restaurant Association, along with many other food related organizations, strongly supported the waiver request in order to provide some relief from the corn-based ethanol mandate.

As the U.S. corn supply diminished last year, corn prices quickly escalated, resulting in higher food costs for the restaurant industry. As with many other commodities that have seen greater price volatility, and tighter margins, the more the use of the corn supply is conflicted by food and fuel price competition, the more we expect this to continue to impact food prices. This was also extremely problematic for an industry that is very price competitive and impacted by consumer spending and confidence. In addition, the rising feedstock prices caused livestock producers to cut production and reduce the U.S. protein supply. This resulted in a ripple effect throughout the food supply chain, which affected all facets of the food industry.

However, this reality for the food industry did not begin with last year's drought, but was only exacerbated by it. Rising food costs were nothing new for restaurant operators who have seen wholesale food costs increase nearly 30 percent in the past six years.[4]

These increases occurred at the same time, as indicated in the white paper, "as corn prices [rose] along with the targets in the Renewable Fuel Standard from an average of $2.15 per bushel from 1997 to 2006 to an average of $7 per bushel in 2013."[5]

In addition, a recent study commissioned by the National Council of Chain Restaurants and conducted by PricewaterhouseCoopers, found that since its implementation, the Renewable Fuel Standard's corn ethanol mandate has increased the demand for field corn and raised the prices of corn, feed, and other commodities.[6] The report noted that these increases are then passed on to restaurants through their purchases of these commodities (e.g. beef, poultry, pork, dairy, etc.).

Consequently, the report concluded that the mandate will increase the costs of U.S. chain restaurants by as much as $3.2 billion annually, each year the RFS remains in place.[7]

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[3] Environmental Protection Agency, "EPA Decision to Deny Requests for Waiver of the Renewable Fuel Standard," http://www.epa.gov/otaq/fuels/renewablefuels/documents/420f12075.pdf, 2012.
[4] National Restaurant Association, 2013 Restaurant Industry Forecast, Economic Outlook, 2013, p. 21-22.
[5] Congressional Research Service, Renewable Fuel Standard (RFS): Overview and Issues, March 13, 2013, pp.19-23. United States Department of Agriculture, USDA Agricultural Projections to 2022, February 2013.
[6] National Council of Chain Restaurants, "Federal Ethanol Policies and Chain Restaurant Food Costs," http://www.nccr.net/flipbook/index.html#/0, November 2012.
[7] Id.

These severe increases are a result of the implementation of the corn-based ethanol mandate and demonstrate that the mandate itself is severely harming the economy, as required by the EPA.

Had the waiver been granted, it would have reduced the harm that restaurateurs and consumers feel today and will continue to feel in the future. Prices for many commodities are projected to remain elevated this year and the U. S. Department of Agriculture expects continued gains in primary market prices for beef, broilers, pork and dairy products in 2013.[8]

The only way to relieve some of this pressure is to carefully examine the requirements of the Renewable Fuel Standard and work to reform it.

**5. What has been the impact, if any, of the RFS on food prices?**

Rising food costs are one of the top business challenges for the restaurant industry, accounting for approximately one-third of every dollar in sales.[9] With the thin profit margins restaurants operate on, any increases in food costs can have a dramatic impact on a restaurant's bottom line.

A vital component to food production in the United States is the availability and affordability of corn. The use of corn and corn sweeteners, starch, and flour is extremely widespread and is found in countless foods. It is also a vital feedstock for meat, poultry, and dairy production. Therefore, when the cost of corn increases and its availability decreases, the entire food chain is adversely affected.

According to commodities expert John Barone, CEO of Fairfield, N.J.-based Market Vision Inc., "The corn crop, a key to the food supply and an important commodity for the foodservice industry, is an official disaster. The crop is integral to feedstock for meat, dairy and poultry production and less of it would lead to a decline in the production of beef, milk and chicken, a decrease in supply and a spike in prices for both the foodservice industry and consumers."[10]

In a letter to the EPA supporting the waiver request of the corn-based ethanol mandate in 2012, we explained that as an end user of proteins, baked goods, and beverages, the restaurant industry is negatively impacted by the same market forces impacting commodities throughout the supply chain.

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[8] National Restaurant Association, 2013 Restaurant Industry Forecast, Economic Outlook, 2013, p. 21-22.
[9] Id at 27-28.
[10] National Restaurant Association, "NRA asks EPA to waive ethanol production mandate," Aug. 16, 2012, http://www.restaurant.org/News-Research/News/NRA-asks-EPA-to-waive-ethanol-production-mandate

As previously stated, in the last six years, wholesale food costs have increased nearly 30 percent. Several factors have contributed to this dramatic rise in food prices, including higher oil and energy prices; the growing global demand from rapidly developing economies such as China and India; and a weak U.S. dollar.

But perhaps the most significant factor, and the only one that policymakers have real control over, is the fact that a larger and larger share of the grain market is being diverted to ethanol production due to the corn – based ethanol mandate of the RFS. Last year more than 40 percent of U.S. corn crops were devoted to fuel production rather than food, driving up food costs across the board for restaurateurs.

The corn – based mandate has created a market for fuel use of this feedstock that has tightened supply margins and contributed to this rise in costs.

In addition, as previously noted, a recent study by the National Council of Chain Restaurants found that the federal government's policy of fostering the use of corn as a source for ethanol in gasoline is artificially inflating corn prices, driving other food chain commodity costs upward, and will result in an increase in costs by as much as $3.2 billion annually.[11]

Finally, according to EPA's own analysis on the impacts of the increased use of renewable fuels under the RFS2 standards, "the increased demand for U.S. agricultural products is expected to raise the overall commodity price structure, leading to an annual increase in the cost of food per capita of about $10 by 2022, or over $3 billion."[12]

These types of price increases and distortions greatly impact our customers and are unsustainable for our nation's restaurants, more than 90 percent of which are small businesses with fewer than 50 employees.

The National Restaurant Association looks forward to working together to prevent these increases by reforming the Renewable Fuel Standard in a way that will benefit consumers, businesses, and the overall economy.

Again, we thank you again for the opportunity to submit comments on this matter.

Sincerely,

Scott DeFife
Executive Vice President, Policy and Government Affairs
National Restaurant Association

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[11] National Council of Chain Restaurants, "Federal Ethanol Policies and Chain Restaurant Food Costs," http://www.nccr.net/flipbook/index.html#/0, November 2012.
[12] Congressional Research Service, Renewable Fuel Standards(RFS): Overview and Issues, March 13, 2013, p. 17.

April 23, 2013

The Honorable Fred Upton
Chairman
Committee on Energy and Commerce
2125 Rayburn House Office Building
Washington, DC 20515

The Honorable Henry Waxman
Ranking Member
Committee on Energy and Commerce
2322A Rayburn House Office Building
Washington, DC 20515

Dear Chairman Upton and Ranking Member Waxman:

On behalf of Nebraska's 23,000 corn farmers, we appreciate the opportunity to comment on your questions related to the Renewable Fuels Standard (RFS) and how it impacts agriculture.

The RFS initially implemented in 2005 has been very successful to date and is doing exactly what it was designed to do: support energy independence and in addition it has strengthened rural economies across many states. In fact, Nebraska as the second largest producer of ethanol in the United States over 5,000 direct and indirect jobs have been created in rural communities because of ethanol production. The average salary of an ethanol plant employee is over $56,000 in a rural community.

Since ethanol production began, over $240 billion in household income has been created since. Additionally, each year local and state revenues generate more than $30 million.

Nebraska also has a unique perspective in what we call the Golden Triangle-corn, cattle, ethanol. We are the third largest producer of corn, number two in cattle on feed along with number one in red meat production in the United States and the second largest producer of ethanol, as mentioned previously. The state's livestock industry benefits the greatest from ethanol production because of distillers grains. Distillers grains are a co-product of ethanol production which reduces and displaces the need for corn and other feed ingredients in livestock rations. The many synergies between the three sectors of the agriculture economy provide the basis for our continued support of each industry.

Farmers today are also fortunate to have the opportunity to provide advanced and cellulosic ethanol production using feedstocks of grain sorghum and corn stover. Although we do not have any ethanol plants using corn stover to produce ethanol, Abengoa Bioenergy located in York, Nebraska conducted some of the initial research on cellulosic ethanol production with partial funding through a DOE grant.

When looking at the 2011 USDA Food Dollar (see below) only $.108 of each dollar goes toward farm and agribusiness. The remainder goes toward processing, transportation, trade, and energy. Less than 11% of retail food costs is related to agriculture. The USDA graph below depicts the

farm share of a dollar from 1993 to 2011. According to the chart the amount of money received by the farm sector for food prices has declined; however the market share (transportation, trade, etc) has risen. How does this relate to food prices? Food prices may be rising but it is not because of the amount of money going back to or related to agriculture; it is because of the such things as oil prices that are in the categories of transportation, packaging and energy. .

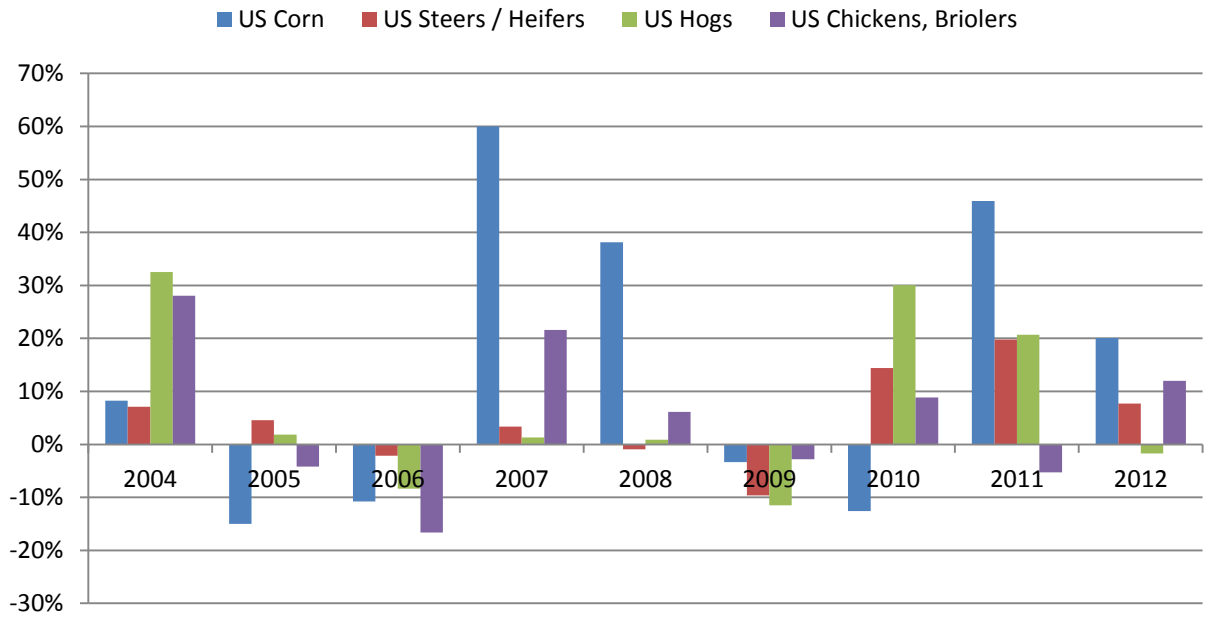
**2011 Food dollar: Industry Group (nominal)**


Table1:

How have the farm and marketing shares changed over time?

| | Avg | 1993 to 2011 |
|---|---|---|
| Farm share | 16.1 | |
| Marketing share | 83.9 | |

Although we can't argue that the RFS may have attributed to the increase in corn prices, we do argue that many other factors are involved also; factors that include the value of the dollar, role of speculators in the commodity markets and greater international demand for commodities and protein. ; However, when you compare the price of corn and livestock prices from 2004 to 2012 there is not one commodity that has consistently shown an increase or decrease in price from previous years. Even after the RFS was implemented in 2007, corn prices have shown a decrease in price in 2009 and 2010 compared to the prior years. Cattle, hogs, and chickens have also shown an increase in prices since the RFS was implemented even in years when corn decreased in price. To say the RFS has created an artificial market for corn is far beyond the truth as the chart below proves. If one if going to pinpoint the RFS as "the" factor in raising corn prices, we state that all commodity and livestock prices have risen, thus another benefit to rural economies across the nation,




Lastly, ten governors petitioned the EPA last year to waive the RFS. We believe the EPA was justified in denying their waiver request as they didn't prove the RFS was causing economic harm. But instead, as we know last year was a tough year for agriculture with the damaging effects of the drought that stretched across a large portion of the U.S. The drought is what caused economic harm to many states, not the RFS (is this better stated?).

It is important to look at the entire agriculture picture when determining if the RFS is working. Jobs have been created, state and local revenue has been enhanced, energy independence is increasing and we are reducing greenhouse gas emissions since the implementation of the RFS.

In closing, we strongly believe the RFS is necessary meet the requirements it was initially designed to do: increase energy independence.

Tim Scheer, Chairman

Tim E. Scheer

Nebraska Corn Board

# Global Security and the RFS

Dominic K. Albino, Casey Friedman and Yaneer Bar-Yam

*New England Complex Systems Institute*

*238 Main St. S319 Cambridge MA 02142, USA*

(Dated: April 29, 2013)

In response to the House Committee on Energy and Commerce request for response to the Renewable Fuel Standard (RFS) Assessment White Paper, we wish to bring to your attention that the RFS is having a substantial negative impact on global security. Dangerously elevated worldwide food prices currently sit at the threshold above which widespread global unrest is expected, and these prices are elevated primarily due to the increased demand for corn ethanol caused by the RFS.

Quantitative research demonstrates that no factors besides the biofuels mandate and financial speculation can account for the behavior of prices since 2005 [1], despite the often discussed proposal of several other major factors such as drought, increasing global meat consumption, exchange rates, and energy prices.

The amount of corn diverted to ethanol in the US accounts for 95 million metric tons (mmt), over 4% of the total global grain production, a much larger impact than any other factor. Drought in Australia, a frequently proposed explanation for the 2008 price spike, fails to explain the price increases because of Australia's small share in global grain production (less than 2% in total, and the impact of the drought was much smaller) and because the drought did not actually align with price increases. Rising demand for meat (particularly from China and India) has been met by local production, causing a difference of only 5 mmt on the world market from 2004 to 2010—an effect dwarfed by the 95 mmt decrease due to corn to ethanol conversion (or 73 mmt even after accounting for the DDGS feed byproduct). If USD-euro exchange rates were responsible, food prices in euros would have decreased rather than increased, and this was not the case, so currency exchange rates cannot be a key driver of a food price increases. Finally, in the 2008 price spike, the oil price peak followed the wheat price peak, and therefore could not have been the cause of food price increases.

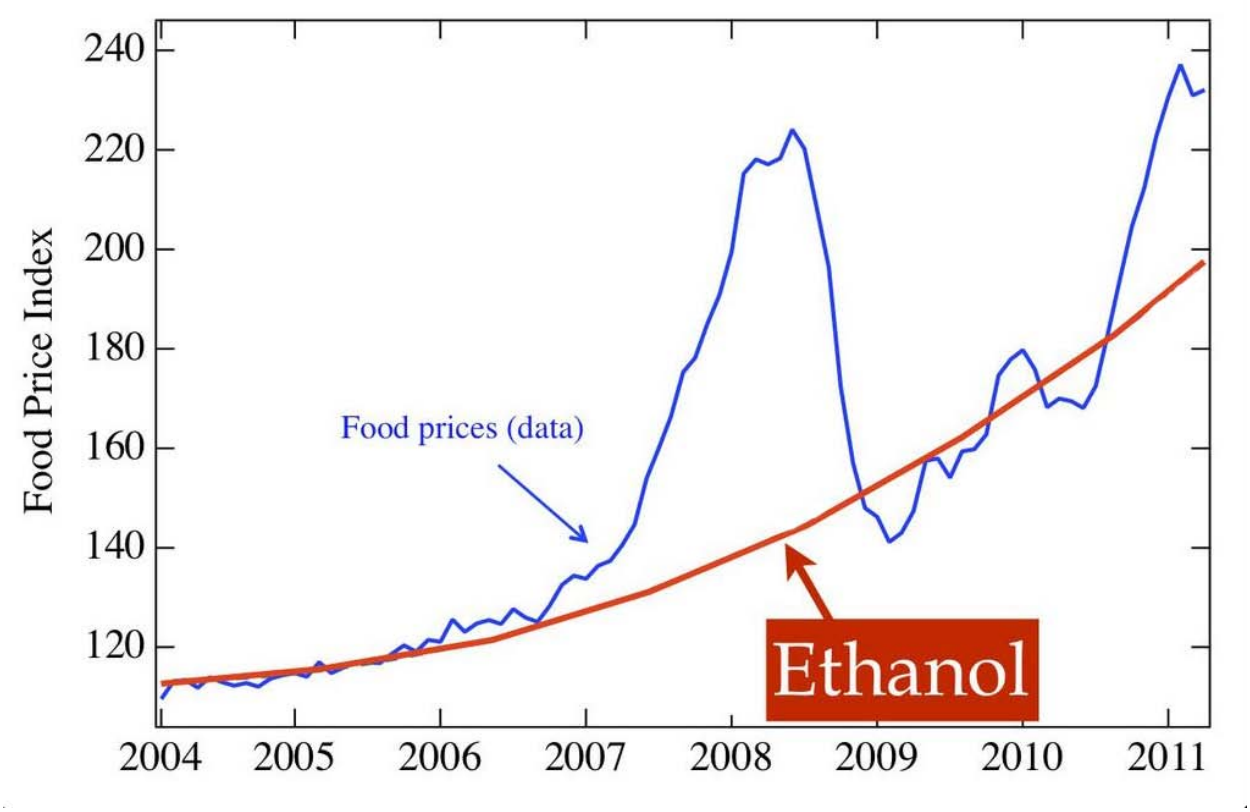



FIG. 1: The FAO Food Price Index (blue) compared to a supply and demand model of food prices (red) based on the conversion of corn to ethanol in which price changes are driven by increasing ethanol production. A more complete quantitative model that fits food prices is given in [1]. The price deviations from the ethanol curve in 2008 and 2011 were shown to be accurately described by the effects of financial speculation.

Corn to ethanol conversion is the only major change in actual supply or demand capable of causing the long term increase by a factor of 2 in world food prices. The only other important direct cause are market bubbles and crashes, which resulted in price spikes in 2008 and 2011. Corn to ethanol conversion is responsible for the long-term food price increase and is directly linked to the RFS.

Such drastic increases in basic food prices are severely impacting vulnerable populations worldwide, with major security ramifications across the globe. Despite the many possible contributing factors, the timing of violent protests throughout North Africa and the Middle East in 2011 as well as earlier riots in 2008 coincides with large peaks in global food prices, and there is evidence of a specific threshold above which unrest become likely [3].

These observations suggest the protests and violence reflect the sudden desperate straits

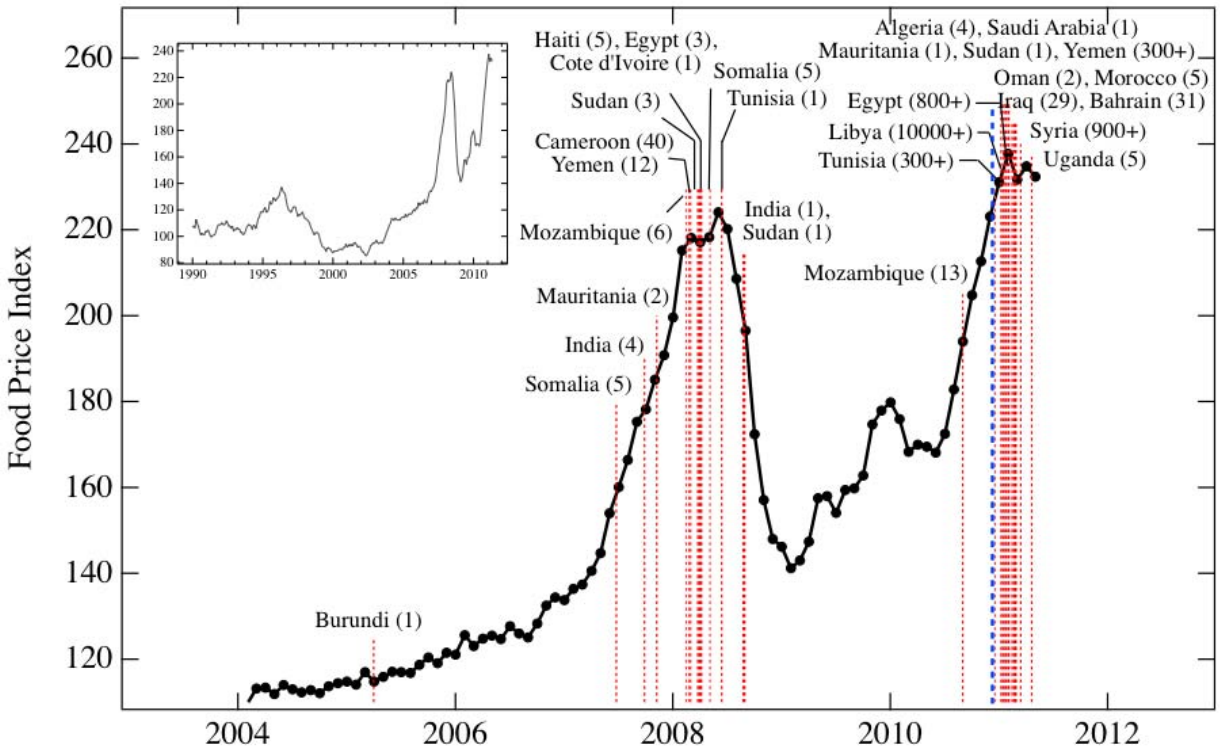



FIG. 2: Time dependence of FAO Food Price Index from January 2004 to May 2011. Red dashed vertical lines correspond to beginning dates of food riots and protests associated with the major recent unrest in North Africa and the Middle East. The overall death toll is reported in parentheses. Blue vertical line indicates the date, December 13, 2010, on which we submitted a report to the U.S. government, warning of the link between food prices, social unrest and political instability [2]. Inset shows FAO Food Price Index from 1990 to 2011.

of vulnerable populations. Current food prices are at the threshold. If food prices continue to increase because supply is reduced further in favor of biofuel production, we are at risk for increasing global social disruption. Reducing the RFS mandate should lead to decreasing prices, a reduction in global hunger and desperation, and an increase in global security. Countries where social disruption has been driven by food prices, such as Yemen, are breeding grounds for terrorist activities [4]. Reducing the level of social disruption around the world should improve security nationally and internationally.

We gratefully acknowledge Karla Z. Bertrand for her assistance in preparing this comment.

[1] M. Lagi, Y. Bar-Yam, K. Bertrand, Y. Bar-Yam, The food crises: A quantitative model of food prices including speculators and ethanol conversion, *arXiv:1109.4859* (2011 http://necsi.edu/research/social/foodprices.html).

[2] M. Lagi, Y. Bar-Yam, Socio-economic impact of the financial crisis: Complex systems scoping analysis, *New England Complex Systems Institute technical report* (2010).

[3] M. Lagi, K. Bertrand, Y. Bar-Yam, The food crises and political instability in North Africa and the Middle East, *arXiv:1108.2455* (2011 http://necsi.edu/research/social/foodcrises.html).

[4] A. Gros, A. Gard-Murray, Y. Bar-Yam, Conflict in Yemen: From ethnic fighting to food riots, *arXiv:1207.5778* (2012 http://necsi.edu/research/social/yemen/).

# Comment: Renewable Fuel Standard Assessment White Paper #2

Casey Friedman, Dominic K. Albino and Yaneer Bar-Yam

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(Dated: April 29, 2013)

We are writing in response to the House Committee on Energy and Commerce request for stakeholder comment on the Renewable Fuel Standard (RFS) Assessment White Paper #2.

With respect to Question 1:

"What has been the impact of the RFS on corn prices in recent years? What has been the impact on soybean prices? Have other agricultural commodity prices also been affected?"

Dramatic price increases in grain costs coincided with the implementation of the RFS mandate. Our research has directly analyzed the contribution of other factors raised as possible drivers of grain price increases and shown that none of them can be responsible[2]. These factors include rising meat consumption, drought in Australia, rising energy prices, and dollar-euro exchange rates. The growing requirements of the RFS, in conjunction with commodity futures speculation, suffice to accurately explain the increase in food prices. Our analysis shows that the price of basic foods has risen by a factor of two (100%) as a direct result of the increasing rate of corn to ethanol conversion and no other factor can explain this price increase (see 1). This price increase reflects both the increase in corn price and the effects of that increase on other grains and basic foods, including milk and meat as reflected in the FAO Food Price Index.

We also wish to bring to your attention a number of inaccuracies and misleading statements in the body of the White Paper:

A. White Paper: "...only a portion of the 40 percent of corn used to produce ethanol is lost for other purposes, as the byproducts of the ethanol distillation process are used as animal feed."

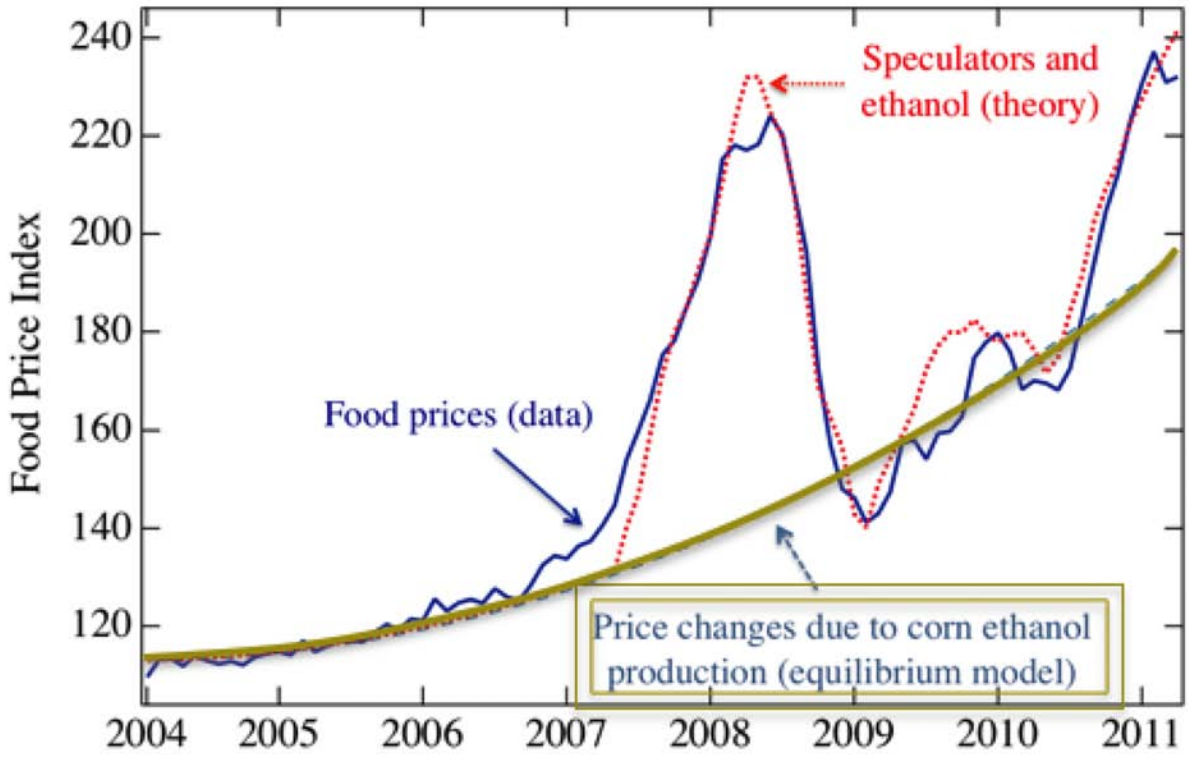


FIG. 1: **Food prices and model simulations** - Plots of food prices and models that quantitatively account for recent price increases: The FAO Food Price Index (blue solid line) since 2004. The impact of mandated corn to ethanol conversion (yellow line) from a supply and demand quantitative model. The ethanol demand shock causes food prices to increase proportional to the amount of corn to ethanol conversion. The full quantitative model further incorporates the role of commodity speculators (red dotted line). See Ref. [2] for details on the analysis.

The residual from corn to ethanol conversion used in feed (DDGS) accounts for a maximum of 31% of the total corn used. Limitations of actual processing make the amount even lower. In 2011, DDGS reached only 23% of corn converted to ethanol [6]. This means that 77% of the corn used for ethanol is lost for use in feed.

B. White Paper: "Based on the agency's analysis, EPA Administrator Jackson concluded that 'it is very likely that the RFS volume requirements will have no impact on ethanol production volumes in the relevant time frame, and therefore no impact on corn, food, or fuel prices.'"

While we do not concur with many of the specifics of the analysis, the short-run time frame applied to the analysis used by EPA is not representative of the more extended time

frame of the RFS. A one-year time frame is insufficient to see production shifts due to the long-term nature of the capital investments, especially if the requirement resumes in the following year at an even higher level. A reduction in the mandate for multiple years would have drastically different results, as the EPA analysis stated. Administrator Jackson's statement, as given, is taken out of context and may be considered to suggest that the RFS has not had a major impact, or that reducing the RFS would not have an impact. Neither conclusion is correct.

C. White Paper: "To the extent that the RFS has driven up feedstock prices and reduced supplies of agricultural products available for export, one would expect to see land use changes in other countries, with greater incentives to clear new land for agricultural production. The scale of this effect, however, is subject to debate."

Expanding demand for grain based biofuels by its nature diverts basic grain from those who can least afford it. While agricultural output may increase in some countries, that production will also be diverted to meeting biofuels demand in the United States and Europe. Indeed, in countries where large-scale land acquisitions are substantial, approximately 40% of the land acquired by foreign investors is being directed toward producing biofuel feedstocks [7]. Worsening hunger has been reported even with increasing agricultural production [8].

D. White Paper: "There is no question that the RFS has provided benefits for America's corn farmers . . . The impact of the RFS on the farm economy extends beyond its benefits to feedstock growers . . . Nonetheless, the RFS has engendered opposition within the agricultural sector, especially among those who use corn as feed."

The RFS was originally intended to address national energy security and environmental concerns, for which it has proven ineffective. The energy independence and environmental aims of the RFS were to be achieved by reducing petroleum consumption. In practice, the total ethanol production is less than 1% of US energy consumption, an irrelevant amount from the point of view of security. Moreover, the production of ethanol consumes roughly as much energy from fossil fuels as the ethanol itself contains. Under optimal conditions,

ethanol energy content may exceed energy inputs by about 20%, but under typical real world conditions there is little or no energy surplus [12].

The remaining rationale of supporting farm incomes is inconsistent with the principle that self-regulation of markets provides the most equity and efficiency. Absent a compelling national security and environmental policy interest, providing welfare for farmers through the RFS is counter to a policy of enabling free market systems to serve their function. By introducing ethanol based farm support, the RFS has caused a large-scale indirect effects—such as those on the livestock sector and on consumers nationally and internationally—which are difficult if not impossible to mitigate.

*We gratefully acknowledge the assistance of Karla Z. Bertrand in the preparation of this comment.*

## References

1. Committee on Energy and Commerce, Renewable Fuel Standard Assessment White Paper: Agricultural Sector Impacts. United States House of Representatives, (4/18/2013).

2. M. Lagi, Yavni Bar-Yam, K.Z. Bertrand, Yaneer Bar-Yam, The Food Crises: A Quantitative Model of Food Prices Including Speculators and Ethanol Conversion. *arXiv:1109.4859*, (9/21/2011).

3. D.K. Albino and Y. Bar-Yam,Myths and Facts about the Renewable Fuel Standard. NECSI Report 2013-01-01 (1/31/2013).

4. D.K. Albino, K.Z. Bertrand, Y. Bar-Yam, Food for fuel: The price of ethanol. *arXiv:1210.6080*, (10/4/2012).

5. D.K. Albino, K.Z. Bertrand, Y. Bar-Yam, Food FAQ. NECSI Report 2012-09-01 (9/28/2012).

6. World Agricultural Outlook Board, World agricultural supply and demand estimates, USDA (2012). http://www.usda.gov/oce/commodity/wasde/latest.pdf

7. G. Schoneveld, Potential land use competition from first-generation biofuel expansion in developing countries, Center for International Forestry Research, Occasional Paper 58 (2010).

8. Elisabeth Rosenthal, As Biofuel Demand Grows, So Do Guatemala's Hunger Pangs, *New York Times*, (1/5/2013).

9. R. Naylor, Biofuels, Rural Development, and the Changing Nature of Agricultural Demand, Center on Food Security and the Environment, Lecture Paper (2012).

10. Energy Information Agency, U.S. Fuel Ethanol Plant Production Capacity (5/30/2012). http://www.eia.gov/petroleum/ethanolcapacity/index.cfm

11. Energy Information Agency, Annual Energy Review 2011 (2012). http://www.eia.gov/totalenergy/data/annual/pdf/aer.pdf

12. D. J. Murphy, C. A. S. Hall, B. Powers, New perspectives on the energy return on (energy) investment (EROI) of corn ethanol, *Environment, Development, and Sustainability* 13, 179 (2010). http://www.springerlink.com/content/j458318434015735/fulltext.pdf

13. Environmental Protection Agency, Notice of Decision Regarding Requests for a Waiver of the Renewable Fuel Standard, *Federal Register* 77, 228 (11/27/2012), pp. 70752-70776. www.gpo.gov/fdsys/pkg/FR-2012-11-27/pdf/2012-28586.pdf

Sir, I am responding to the request for comments on the RFS.

I own a farm, beef cattle, in Kentucky. The impact of the dramatic increase in the price of corn following the doubling of the blending mandate in 2007 has been substantial. The requirement of increasing the gallons of ethanol blended into the gasoline supply has driven up the price of corn as well as all other feed stuffs, because of substitution of feed rations. The increase in the price of feed stuffs affects more than beef cattle; it affects pork, chicken, and dairy producers too. I will list a few of the problems I see with ethanol:

1. Ethanol from corn is not a renewable resource. To produce ethanol in the quantities required by the RFS requires massive amounts of fertilizer - nitrogen, phosphate and potassium. Phosphate and potassium are minerals mined from the earth, and ever how much there is, that is all there is. Nitrogen in plentiful in the air, but not usable by the corn plant in that form. Nitrogen in the air can be converted into a form suitable for the corn plant by a process that requires natural gas. Natural gas is also a finite resource, that while currently in good supply, ever how much there is, that is all there is. Thus ethanol from corn is not a renewable resource. Those who advocate that it is are misleading the public.

2. Ethanol from corn may not produce more energy that is required to produce it, or if so, very little more. There are two university studies that show ethanol from corn requires more energy that it returns. A USDA study claimed ethanol from corn returned 1.34 units of energy for 1 unit of input. Thus ethanol returns only .34 units of surplus energy as the result of the process. I don't know which is correct, but the market should decide such questions, not the government. There is a very interesting discussion of surplus energy and how it makes our rich and diverse lifestyle possible. It is by Chris Martenson and can be viewed at www.peakprosperity.com. After going on this site, click The Crash Course on the top left of the screen and scroll down to Chapter 17b, Energy Budgeting. The author presents a history of the Age of Oil from its early years in which the surplus energy returned was about 100 to 1. That is for every unit of energy necessary to produce oil, it returned 100 units of energy. The author states that Saudi Arabia is able to produce surplus energy at that lever today. The chart in this chapter also presents the surplus energy from other energy sources, and explains that ethanol from corn is the worst choice the government could have chosen to subsidize, except perhaps hydrogen. I recommend its reading.

3. The demand for corn has caused some farmers to put land into crop production that is marginal at best. This land proved years ago not

suitable for sustained crop production. Yet the lure of quick profits at the expense of long term sustainability has proven too much for some to pass up. The increased run off of fertilizer, soil erosion and loss of wildlife habitat are the results. I see land that has been grass for as long as I can remember that is now being planted in corn.

4. Some oil companies are using ethanol to meet environmental requirements. While that sounds good, the increased emissions at the production and distribution level likely offset the reduction at the gas pump. Another consequence of the ethanol blending mandate is that it likely precludes other technologies from being developed to meet emissions requirements. In other words, if the oil companies must blend increasing amounts of ethanol in the gasoline supply, there will be little incentive to search for a better method of meeting environmental requirements.

5. The demand for ethanol has exacerbated the effects of drought the last two crop seasons. At current levels of the RFS, the annual carry over surplus has been reduced to critical levels. If we run out of corn, we cannot stop feeding cattle, hogs and chickens. Ethanol producers can shut their plants, but our livestock will starve.

6. The ethanol industry was created by the government. The government should repeal the blending mandate, and the sooner the better. The corn farmer will do just fine with the current level of demand without ethanol.

Thanks for the opportunity to comment. While I don't expect anyone to actually read this, I will have had my say.

Norman Harned
270-784-8598

The Honorable Fred Upton
Chairman
Energy and Commerce Committee
U.S. House of Representatives
2125 Rayburn House Office Building
Washington, DC 20515

The Honorable Henry A. Waxman
Ranking Member
Energy and Commerce Committee
U.S. House of Representatives
2322A Rayburn House Office Building
Washington, DC 20515

*via email at: rfs@mail.house.gov*

April 29, 2013

Dear Chairman Upton and Ranking Member Waxman:

Novozymes, a leader in biotechnology and innovation, is pleased to respond to your request for information regarding the positive benefits the Renewable Fuel Standard (RFS) is having on our nation's agricultural system. America's farmers and agricultural producers are the most productive in the world. We are proud to have technology and policy that supports them, and appreciate the opportunity to discuss that technology and policy.

Novozymes has more than 7,000 patents and 700 products at work in 130 countries. We make industry-leading enzymes that act as biocatalysts, removing trans-fats in food, lowering the temperature needed to wash a consumer's clothes and converting biomass, from switch grass or corn stover, into biofuels. Our solutions help companies use fewer chemicals, raw materials, energy and water, and generate less waste. Our technologies save our customers and consumers energy and money.

Cellulosic biofuels is our largest global R&D effort with more than 150 employees dedicated to its development. Our US investment– and that of many industry peers – is driven in large part because of the RFS.

We know farmers face challenges: Rising fertilizer and fuel prices, for examples. Every year they do it – and every year they do more. We believe one of the great strengths of the RFS is that it's helping farmers and agriculture.

**Agricultural biotechnology**

Novozymes sustainable agriculture technologies help farmers get more products from fewer inputs, reducing waste and environmental impact and saving money. BioAg is growing globally at a rapid pace due to growing populations and increasing demand for more sustainable

production. There is increasing need for chemical and fertilizer replacements due to scarcity and increasing price volatility. We have solutions:

- Our microbial-based biofertility, biocontrol, and bioyield enhancer products work to naturally produce healthier crops and improve yields.
- Our biocontrol agents are powerful against insects, disease, and weed pests.
- Our bioyield enhancers are products derived from plants and microorganisms that enhance the crop's nutritional capabilities to improve plant growth, increase stress tolerance, and improve yields. We have brought advances such as elite rhizobia, LCO Promoter Technology® and *Penicillium bilaii* to farmers from Texas to India – all made by our employees in North America.

Novozymes just launched a product for farmers and producers called Met52. Met52 is a bioinsecticide that has no chemical residue, little potential for resistance, can be used with traditional insecticides, and is effective against insects that are often resistant to other pesticides – including thrips, mites, whiteflies and vine weevils.

This business gives Novozymes a unique perspective in response to the questions asked by your Committee in the recently released white paper.

**RFS and agriculture**

Novozymes innovates for first generation corn ethanol as well as advanced biofuels. Our latest breakthrough, introduced just last year, was our Avantec product. Avantec increases yields in corn ethanol by 2.5%. This significantly boosts the outputs and profits of biofuel producers and gives them a clear competitive advantage. In fact, if all corn ethanol plants in the U.S. started using Avantec, they would together reduce corn inputs by about 3 million tons (116 million bushels). Over the past 5 years, continuous improvements in enzyme technology from Novozymes have helped the biofuels industry increase starch conversion by 5%.

All across the United States, farmers are growing more using less land. In 1980, farmers averaged a yield of 91 bushels of corn per acre and produced a crop of 6.6 billion bushels. In 2009, just a generation later, farmers produced an average yield of 164.7 bushels per acre and harvested 13.1 billion bushels. This doubling of the American corn crop was achieved by

planting just 3% more corn acres in 2009 than was planted in 1980.[1] The demand pull from the RFS has increased the amount of corn for feed, food and domestically-made fuel in the U.S.

Additionally, one-third of every bushel of grain processed into ethanol is enhanced and returned to the animal feed market in the form of distillers grains, corn gluten feed or corn gluten meal, a high-protein, high value and highly nutritious animal feed.[2] This means that the very same corn used for ethanol is also used for animal feed. When this diversion of valuable material to the livestock feed supply is considered, ethanol production uses well below the erroneous "40% of the corn crop" cited in your letter. When this reality is considered, only 3% of the global grain crop goes toward ethanol.[3]

**Advanced biofuels and rural economies**

The RFS is strengthening rural communities, driving economic growth and supporting more than 400,000 jobs nationwide. Additionally, the RFS has spurred billions of dollars of investment in advanced and conventional renewable fuel. Advanced biofuels is expected to create another 800,000 long-term careers.

Just last year Novozymes invested more than $200 million in bioenergy in the US and inaugurated the largest enzyme plant dedicated to renewable fuels in the United States with the opening of its advanced manufacturing plant in Blair, Nebraska. The plant created 100 career positions and 400 construction jobs, and specializes in enzymes for both the conventional and advanced biofuel markets.

We chose to build our manufacturing plant in Blair in large part because of the RFS. Biorefineries across the world – in the United States, China, Italy and Brazil – will use enzymes made at our Nebraska plant. In fact, global production capacity of advanced biofuels is estimated to reach approximately 15 million gallons in 2012 and 250 million gallons by 2014.

In January 2012, the USDA announced a $25 million partnership with Fiberight. The commitment will support the construction of a Blairstown, Iowa plant to turn waste into biofuels, producing six million gallons per year when fully operational in the first half of 2013. Fiberight will invest $20 million in the plant, combined with the $25 million federal investment. The plant

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[1] http://www.ethanolrfa.org/news/entry/more-ethanol-fewer-resources-increasing-benefits-more-corn-on-fewer-acres-I/

[2] http://www.ksgrains.com/ethanol/ddgs.html

[3] http://www.ethanolrfa.org/pages/ethanol-facts-agriculture

will employ approximately 55 employees when fully-operational and generate 100 construction jobs.

The state of North Carolina is home to the Biofuels Center, the first facility of its kind in the country, and helping to develop a large-scale biofuels industry sector to reduce the country's dependence on imported petroleum.

Novozymes and its partners have invested one billion dollars in bringing these technologies to market and creating associated careers – and we are ready to invest one billion more. There are dozens of companies like us – and our investments are creating jobs, economic opportunity, and energy security and saving consumers money.

In addition to these clear benefits, created as a result of the RFS' stability, the American biofuels industry today provides more transportation fuel to the U.S. market than we import from Saudi Arabia.

According to the bio-era™ *study The U.S. Economic Impact of Advanced Biofuels Production: Perspectives to 2030*, cellulosic and advanced biofuels will have a positive impact on both rural economies and the nation's economy as a whole. Key findings in the analysis yielded the following conclusions:

- Direct job creation from advanced biofuels production could reach 29,000 by 2012, rising to 94,000 by 2016 and 190,000 by 2022. Total job creation, accounting for economic multiplier effects, could reach 123,000 in 2012, 383,000 in 2016, and 807,000 by 2022.
- Investments in advanced biofuels processing plants alone would reach $3.2 billion in 2012, rising to $8.5 billion in 2016, and $12.2 billion by 2022. Cumulative investment in new processing facilities between 2009 and 2022 would total more than $95 billion.
- Direct economic output from the advanced biofuels industry, including capital investment, research and development, technology royalties, processing operations, feedstock production and biofuels distribution, is estimated to rise to $5.5 billion in 2012, reaching $17.4 billion in 2016, and $37 billion by 2022.
- Taking into consideration the indirect and induced economic effects resulting from direct expenditures in advanced biofuels production, the total economic output effect for the U.S. economy is estimated to be $20.2 billion in 2012, $64.2 billion in 2016, and $148.7 billion in 2022.
- Advanced biofuels production under the RFS scenario could reduce U.S. petroleum imports by approximately $5.5 billion in 2012, $23 billion in 2016, and nearly $70 billion by 2022. The cumulative total of avoided petroleum imports over the period 2010–2022 would exceed $350 billion.

The development of biorefineries for cellulosic and other advanced biofuels and renewable chemicals will also leverage increasing agricultural productivity and industrial biotechnology innovation to create a robust, sustainable bioeconomy. Integrated biorefineries make multiple products from biomass streams, just as oil refineries make multiple products from petroleum. Using biomass efficiently, reusing waste streams and increasing productivity and yields are the keys to sustainability.

**2012 RFS waiver request**

Novozymes accepts EPAs evaluation that granting a waiver of the RFS was unwarranted and would not have provided the solutions and relief the petitioners needed. We believe waiving the RFS would have caused certain harm to the biofuels and agriculture industries, the workers who drive them – and the clear economic and energy security benefits they are generating for our country. In the future, we need a more constructive dialog with livestock and poultry groups about the causes of high feed costs and the impacts on retail food prices.

The EPA evaluated data based on the waiver requests that were made and determined that the evidence did not support the claims:

*"EPA's analysis shows that it is highly unlikely that waiving the RFS volume requirements will have a significant impact on ethanol production or use in the relevant time frame that a waiver could apply (the 2012-2013 corn marketing season) and therefore little or no impact on corn, food, or fuel prices. We analyzed 500 scenarios, and in 89% of them we see no impacts from the RFS program at all. Looking across all 500 scenarios, including those 11% of scenarios where RFS requirements would have an impact on the corn and other markets, the average impact on corn prices is only 7 cents a bushel, less than a one percent change in corn prices."*

The reality is that the RFS does not control the price of corn.

**Global land use**

Global land use changes (both direct and indirect) are accounted for in administration of the RFS, they are included as part of the greenhouse gas emission reduction requirements. It is incorporated in the modeling used to qualify pathways for compliance with the RFS.

**Flexibility**

The RFS is a strategic, well-crafted policy with a large amount of flexibility built in. We have seen this flexibility utilized on multiple occasions thus far such as the 2012 waiver request due to drought. For additional detail, see supporting document *"RFS Flexibility Provisions"*.

**Conclusion**

The RFS has increased the amount of corn for feed, food and domestically-made renewable fuel in America. It's created thousands of jobs – from scientists, engineers and factory operators to construction workers and farmers – allowing people to support their families and the country. It is also bipartisan, first signed by President George W. Bush and still supported today.

We understand poultry and meat producers are concerned. They are our customers, too, and we know costs impact them. But ethanol is not the cause for the issues at hand.

The RFS was devised as a driver of developing sustainable food, feed, fiber, biofuels, renewable chemicals, and bioproducts which can be produced in American helping rural communities grow their job base. And it is working.

To capitalize on the momentum of the industry, private companies need stable, long-term policy support. Policies like the RFS encourage companies to innovate and invest. Those policies need to continue, uninterrupted.

Novozymes supports the RFS as enacted and trusts EPA to administer the program utilizing its authority as provided in the law. We are happy to provide additional information or answer questions. Thank you for your time and consideration.


Cc: Congressman Lee Terry
Congressman G.K. Butterfield